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THE MEASUREMENT OF ACHIEVEMENT IN SHORTHAND

by

Elmer Rhodes Hoke

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A dissertation submitted to the Board of University Studies of the Johns Hopkins University in conformity with the requirements for the degree of Doctor of Philosophy

by

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THE MEASUREMENT OF ACHIEVEMENT IN SHORTHAND

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INTRODUCTION

During the last fifteen years there has been developing in university schools of education and in the practice of leading educators in the field, what is known as the testing movement. Teachers and schools have always felt the necessity for some sort of measure of the results of the educational process. In the past we have attempted to measure school efficiency by means of examinations and teachers' marks. In recent years there has been a growing tendency on the part of leading educators to give up reliance upon examinations and teachers' marks, and to depend instead upon the results secured by the use of certain tests and scales that have been scientifically constructed.

There are several types of evidence that teachers' marks have been inaccurate. Probably noone who has had much schooling will have any difficulty in calling to mind teachers who were known as "hard" or "easy" markers. We know full well that an examination paper in geometry marked 95 by one teacher, might be marked 65 by another. In fact such a paper was, for the sake of the experiment, graded by 116 different teachers. One-third of them marked it at from 27 to 65, one-third between 65 and 75, while the remaining third of the teachers assigned to this paper marks ranging from 75 to 91. The extreme marks given to this paper were 27 and 91.

Again, in almost any high school it will be found that different teachers in the same department will give the same pupils totally different marks, one teacher giving many C's and D's with very few or no A's, while another teacher in the department will give all or nearly all A's, with very few C's or D's. In short, teachers' marks represent a subjective estimate of pupils' achievement. What is needed is an objective measure of such achievement. In other words, a mark is desired which will reflect the quality of the object, that is, the examination paper or the pupil's performance. The teacher's mark is determined not only by this object, but in a large measure by the subject--the personality of the teacher.

There are several reasons why teachers' marks are inaccurate. In the first place, the teacher either makes no attempt, or fails in the attempt, to estimate the relative value of the questions of an examination, but merely assigns a value of, say, 10 per cent to each of ten questions, or 4 per cent to each of twenty-five words in spelling. As a matter of fact, one question or one word may be ten times as difficult as another. Whenever experiments have been conducted in which teachers have attempted to judge the difficulty of examination questions, their judgment has been found to be very unreliable. The result is that the score of the pupil who solves the more difficult problems

is not a fair statement of his ability or achievement as compared with the scores attained by other pupils on the easier problems. We have no unit of measurement in such a case. The ten points received by one pupil may mean something entirely different from the ten points earned by another pupil on a different exercise. It is as if different grocers had different scales, so that a pound of sugar from one store would contain three ounces, from another store five ounces, from another twelve, and from still another twenty.

Another objection to the teacher's mark is that the rate at which pupils work, or the time required, is not measured. Usually a very long period is given for an examination. The bright pupil will not be occupied during the entire time. His ability has not been measured. Results are therefore not comparable. The same score may mean totally different things. In one case a score of fifty may mean five exercises correctly done in thirty minutes; in another case it may mean five exercises completed in two hours. Two pupils may get the same score, yet differ widely in ability.

Moreover, the traditional examination and its mark do not afford the teacher any means of interpreting the mark. The teacher has no standard or normal performance with which to compare the achievement of the pupil. No teacher of shorthand has hitherto been able to state as a fact, "My class averages so many per cent above

(or below) classes in other schools throughout the country, in the ability to read shorthand notes." We have had no such standards with which to compare our results. It is now possible for an elementary-school teacher to say of a boy in her class, "He is just so many per cent above the average boy of his age in the United States in his ability in spelling." The same may be done for handwriting, arithmetic, and other school subjects for which standard tests or scales have been constructed.

It is the purpose of this investigation to construct tests for Gregg Shorthand which will be free from the objections to the traditional type of examinations, and at the same time accomplish still other desirable results which will be discussed hereafter. The advent of similar tests and scales in other subjects has given an impulse to experimentation in education. This has resulted in better teaching. Whenever an adequate test is developed for any school subject, the teaching of that subject is inevitably improved. It is true that after the test has revealled its facts, the teaching problem is still to be solved and the work still to be done. But without the facts which the standard test reveals, a very important incentive, and in some cases important suggestions, for better teaching methods are lacking. The standardized test is therefore an instrument which shorthand education

can no longer afford to neglect. Experimentation in methods of teaching must await measures of the results of teaching.

The necessity of constructing standard tests for the various school subjects, including shorthand, is stated by Thorndike as follows: "What makes quantitative work in education hard is that it deals with facts of human nature and behavior. Complexity, variability, and the absence of proper units and scales of measure are the three great difficulties..... The complexity must be endured, the variability can be overcome by modern statistical technique, and the lack of units and scales is to be remedied by special investigations."[1]

We could have no sciences of physics, chemistry, astronomy, or geography if we did not have such measures as those of weight, length, area, volume, and temperature. Just so we can never have a science of education unless we can measure educational facts. Without measures education is a happy-go-lucky, hit-or-miss process. It may accomplish much <u>good</u> work, but it can never accomplish the <u>best</u> possible work until we can say in education "I know", not "I think". We have measures which make it possible for us to <u>know</u> how much heavier or taller one boy is than another, even though one be in San Francisco and the other in New York. It is important to be able to know also how much <u>faster</u> or <u>better</u> the one writes shorthand than the other. For science and <u>progress always</u> wait upon measurement.

1. Quantitative Investigations in Ed. Sch. Rev. Monograph.

Still other values of standard tests should be mentioned. Diagnostic tests will serve to point out specific deficiencies or educational ailments, for which it becomes the duty of the teacher to prescribe and administer a remedy. Indeed, the giving of the test will offtimes suggest the remedy to apply. Two forms of a test may be used, before and after a given period of experimentation with different methods of teaching, in order to ascertain which of the methods has produced the better results. Again, the standard test often helps to motivate work and secure interest. Pupils will accept the scores they make as just and fair. They will set to work to surpass their own past records. Many pupils do not take teachers' marks seriously, knowing full well that they may reflect the teacher's dyspeptic condition or excessively lenient good-nature. The standard test score, however, is not only recognized as just and fair, but has the added interest that comes from knowing what pupils in other schools are doing. Furthermore, the standard test, such as the scale for quality of shorthand penmanship, makes it possible for the pupil to measure his own achievement and progress. Knowledge of success makes for success. The teacher has a similar satisfaction and incentive in judging her work by comparing her medians with standard scores. In these and other ways standard tests should make for the improvement of the teaching of shorthand.

In entering upon this investigation it was recognized at the outset that the use of shorthand is a complex process, involving motor and mental aspects—knowledges and skills. An attempt was made to analyze shorthand into its important components and to plan for the measurement of these isolated functions. It seemed that shorthand was made up of a number of processes, indicated by the questions that one would wish to ask with regard to a pupil whose ability in shorthand one desired to know. These questions appear to be four in number: 1. Can he read his notes? 2. How rapidly can he write? 3. How well does he write, or what is the quality of his notes? 4. Does he know the system--how to write the outlines? In other words, the important factors which one would wish to measure are 1. reading ability, 2. quality of writing, 3. speed of writing, and 4. knowledge of the system as presented in the text-book. This analysis has determined the plan of the investigation. A reference to the table of contents will show that the sections of this report are attempts to provide measures which will enable one to answer these questions.

It is realized that to attempt to construct such a variety of tests and scales as seems to be required is to attempt a rather ambitious program. It is hoped that some part, at least, of the work shall attain to success, and that from the whole undertaking, some good may flow.

Not much attention will be given in this report to methods of administering tests, or to statistical and graphical methods. Those who may wish to use the tests are referred to standard handbooks mentioned in the bibliography for answers to general questions of this sort.

Nor will this investigation touch the question of prognostic tests for shorthand. It appears to the writer to be probable that certain standard tests now in existence will, in combination, serve that purpose well. A pupil who writes a good "hand" will probably write legible notes. A handwriting scale may be used. A pupil who spells well will probably be able to spell well in a somewhat different system (phonetically), and will therefore succeed well so far as knowledge of the system is concerned. A spelling test may be used. Other factors involved, and for which tests are available, are ability to read rapidly, to associate symbols and make these associations automatic, and to remember. The shorthand writer must be able to read notes, associate the shorthand symbols with the letters of the alphabet, and remember the word-signs and forms for words. The writer would predict success in shorthand for one who made good scores on these five tests: handwriting, spelling, reading, association, and memory.[1]

1. Bills: Methods for the Selection of Comptometer Operators and Stenographers. J. of A. Psych., Sept. 1921, pp. 275-286.

THE CONSTRUCTION OF A SCALE FOR THE MEASUREMENT OF ABILITY TO READ SHORTHAND.

When entering upon the problem of constructing some sort of test for the measurement of the student's ability to read correct shorthand notes, the first impulse was to use some of the standardized silent reading tests, simply having them printed in shorthand instead of ordinary type. Further consideration, however, led to the abandonment of this plan, for the reason that it was felt such a test would measure a confusion of two things, rather than merely reading ability. For the most part such tests require some response from the pupil, and these responses are of some unknown degree of difficulty. One could never be sure how much of the difficulty experienced by certain pupils with such a test would be due to the difficulty of the response called for, and how much to the difficulty in reading the shorthand notes. Some of the reading tests attempt to measure comprehension, usually by asking rather puzzling questions about what has been read. These would be, of all tests, the most unsuitable for the measurement of ability to read shorthand notes.

In order to eliminate this element of difficulty in making the required response, the next suggestion

was to use a simple directions tests, printing the directions in shorthand instead of ordinary type, and accepting the correct response as an evidence of the successful reading of the shorthand. But here again investigation showed that such tests were made up of directions which were not "simple", that is, the responses called for were such as involved some degree of difficulty. Again one could not be sure just what part of failure might be due to the difficulty of understanding the directions and the response required. The student might read the shorthand correctly and still fail to make the response required by the test.

The ordinary way by which teachers gauge roughly the ability of pupils to read their notes is to have them attempt to transcribe them on the typewriter, or to call upon them to read in class. Sometimes also shorthand "readers" are used. These are all well and good as classroom exercises but are not very readily capable of greater refinement or of standardization for use as group tests. It is always possible, of course, to standardize more or less the procedure involved in testing individuals as to their ability to read perfect, printed shorthand notes. But teachers do not have time to go into individual testing very extensively. Group tests of reading ability are needed.

The reading of the student's own notes in class is perhaps a good classroom exercise, but can hardly be standardized as a test of reading ability. The transcribing of his notes upon a typewriter is open to a number of objections. The notes themselves are not standardized. Usually they are of different matter, and always vary in their quality as shorthand notes. It is furthermore impossible to say just what part of the total time consumed in the transcription was spent in reading and what part in typing. The good typist might very easily make a better score than the poor typist, even though the latter excelled in his ability to read shorthand. Finally, pupils very often resort to various "cribbing" devices to piece out what they cannot get from their notes.

From all of the foregoing considerations it became evident that an attempt should be made to devise a test in such a way that the particular thing in question, reading ability, would be isolated and measured, in a standardized group test, in which comprehension, or the difficulty of making the required responses, should play no part. Accordingly an attempt was made to devise a test comprised of simple directions which would be absolutely simple indeed, that is, directions which involved zero difficulty.

To this end teachers, graduate students and friends were asked to contribute questions, exercises or directions, the answer or response to which would involve no difficulty, that is, would be given correctly by as nearly as possible one hundred per cent of all who tried them. The following are some of the results:

1. How old are you? Yrs....Mos...
2. What is your name? First.....Last.....
3. How many hands does a man have? .....
4. How many cents make a dime? .....
5. Write any number smaller than twelve. .....
6. Write any word of three letters. .....
7. Can a sparrow play a piano? .....
8. Is vinegar sweet? .....
9. How many thumbs and fingers has a man on his two hands? .....
10. Does a stenographer use his hands or his feet in operating his typewriter? If he uses his hands, write the letter "x" after this sentence. .....
11. When we want to buy something, or do some shopping, as we say, we go to a store, where things are offered for sale. There are five letters in the word store. Therefore write a five after this, and to show that you have been able to read this, write the word store immediately after the figure five. .....
12. We tell time by a clock, temperature by a thermometer, length by a yard-stick, and the capacity of a barrel by gallons. We speak of a bin as containing a certain number of cubic feet or bushels. How many letters are there in the word bin? .....

After some efforts along this line the attempt was given up. It seemed that the exercises were either of some difficulty or ridiculous. It might still be possible to devise a shorthand reading test in this way

but the suggestion came that it would be in many respects more satisfactory to try the completion test method. It was along this line that the test A-1 was actually worked out by a procedure which we shall now describe.

Two actual business letters were selected, having a total length of exactly five hundred words. In these letters every tenth word was underscored to indicate that an alternate word was to be supplied with it, from which the person tested should choose the correct one. The problem arose as to whether the correct word should always be written above the incorrect one. This would evidently be unsatisfactory. The student would soon discover the order. It would be likewise unsatisfactory for the same reason to alternate, having now the correct, now the incorrect word written above. A purely chance order was required. Accordingly a penny was tossed fifty times and the "heads" recorded as meaning that the correct word should be placed above, while the "tails" meant the reverse order.

When it was attempted to select the alternate words it was discovered that due to the workings of associational paths in the mind, the words that suggested themselves were such as had some more or less logical connection with the sentence. This was just what was not wanted, for it would mean that the choices would be "fine" ones,

requiring a good deal of power of discrimination, or in other words, choices of a considerable degree of difficulty. In order, therefore, to secure such words as would make the choices of practically no difficulty, the Ayres Spelling Scale was resorted to, and the words taken from one of its columns. When each underscored word was supplied with its alternate it became apparent that in several instances the word chanced to be one which would make fairly good "sense", thereby making the choice of the right word very difficult. Such words were discarded and still others taken, further down the column of the Spelling Scale, until the choices all appeared to be satisfactory.

In order to ascertain whether these word choices were really of approximately zero difficulty, the two letters were mimeographed, together with directions, as follows:

Read the following business letters and draw a line through the incorrect word in each place where a choice of words is called for. Accuracy is more important than speed, so don't do the work faster than you can do it correctly.

Dear Mr. Jones:

We beg to acknowledge receipt of month note for first annual premium on policy No. 28148 thus putting extra your policy in full force and effect at once.

Dress In event of your death during this year the policy will be paid in full face value, less this note. beside Teach If you should desire to pay this note at any happen time before its maturity, the same will be discounted at the begun rate of 4% per annum for balance of year.

Build You will find enclosed our "Daily Cost of Insurance" setting file forth the easiest way of meeting such obligations. In order to provide encourage its method, we will allow 4% discount for all understand remittances sent us during the year on account of stood your note, thus distributing its burden and relieving its strain.

Fix As one of our policy-holders you are a member of born the Corporation and thus interested with its management in goes building up its membership. In 1915 our business was considerably in hold advance of the year 1914, and we are anxious to drill make the current year a still better one. This army will no doubt be done, but it will be much

follow for us to do it if all our policy stole holders will easier contribute their share in the way of interesting income their friends and in the way of securing their applications.

Paid May we not have you with us in this good work? Every new policy-holder will contribute to the enter greater vitality railroad of the Fund, and therefore to its surplus accumulations, case and thus to larger dividends. This incentive for your sympathetic ticket and active co-operation is therefore worthy of your consideration.

Wishing you account all success in every effort to advance the welfare of while the Fund, we are

Very sincerely yours,

Washington Mutual Real Fund.

Dear Sir:

We are in receipt of your letter of recover recent date in which you ask us to send mountain booklet and terms on the Smithton Typewriter. Following are our terms steamer to district agents whom we expect will appoint sub-agents as speak well as sell direct:

The Smithton Typewriter is retailing those at $75. Our price to agents is $50 Smithton. If might cash accompanies the order a discount of 2% will be allowed begin. We guarantee our machine for a period of one great year against imperfect parts or mechanical construction and will stand deal back of all sales you make.

We are inclosing an illustrated almost folder of instructions to users of our machine and brought under separate cover mailing one of our dealers instruction booklets. If Less you wish to become our representative in your district event we will ask you to outline by counties the territory you off wish to cover.

With your first order we will furnish true some illustrated folders and also some advertising cuts if you took intend to do local newspaper advertising. We will do miss everything possible to help you get business. We are in inform position to fill orders on twenty-four hours notice and will both give a preference to our American agents. Hoping to hear from heart you further if interested, we beg to remain

Respectfully yours who.

In this form the test was given to forty-four boys in the commercial department of the Frederick, Maryland, Boys' High School, and to forty-six girls in a class of another school. The papers were subsequently scored. It was found that the girls made the wrong choice in six-tenths of one per cent of the cases, while the boys made the wrong choice in three and one fourth per cent of the cases. Of 71 errors made by the boys, 36 were on three of the choices: "to-provide", "real-fund" and "file-forth". Of 15 errors made by the girls, 11 were on these same three choices. It appears that in all three cases the words form a phrase, which made the choice confusing. The three difficult choices were therefore changed by supplying other alternate words such as would avoid this confusion. With this change it appears that the test, as printed in ordinary type, would involve certainly less than two per cent of difficulty, and in the case of the girls, less than one-half of one per cent of difficulty. This seemed to be a satisfactorily close approach to zero difficulty, and accordingly the test was now printed in shorthand, with only the word choices in ordinary type. This test is known as "Test A-1, Reading Ability."

By the opening of the school year of 1921-22 the author was able to report tentative standard scores

FOLD OUT

ID

rs Months

the signal is given.

desired.

tead these business
word, so that the
, start,' open your

s, when the signal,

TABLE I A

DISTRIBUTION OF SCORES AND STANDARD MEDIANS ON A-1 TEST BASED ON 492 CASES DISTRIBUTED IN 33 CLASSES IN 17 STATES.

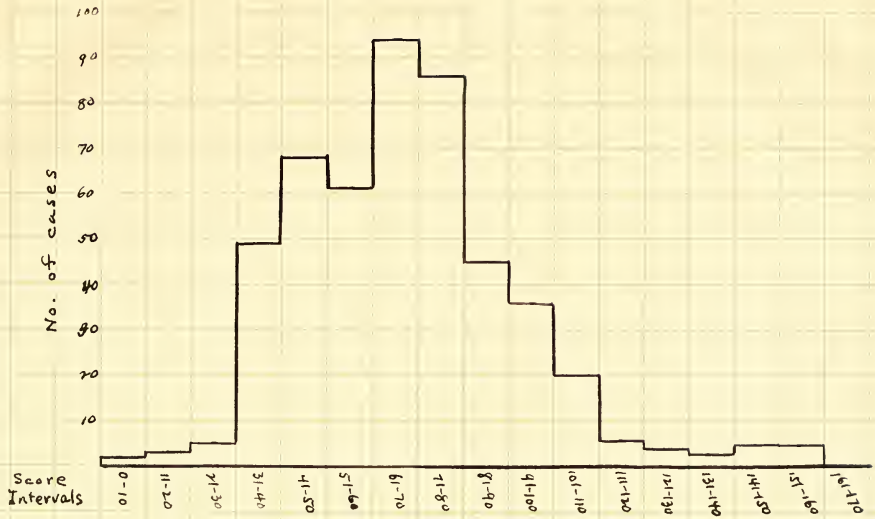
Class Intervals	1 yr. Class	1½ yr. Class	2 yr. Class.
161-170	0	0	0
151-160	2	0	3
141-150	4	0	1
131-140	1	1	1
121-130	2	1	1
111-120	1	1	4
101-110	3	7	10
91-100	11	10	15
81-90	14	19	18
71-80	42	23	21
61-70	38	31	25
51-60	29	16	16
41-50	39	23	6
31-40	25	18	6
21-30	4	1	0
11-20	3	0	0
0-10	0	1	1
No. of cases	218	146	128
Medians	63.5	65.7	76.

TABLE I B.

DISTRIBUTION OF THE CLASSES TESTED

Name of State	No. of Classes
Calif.	1
Conn.	3
Colo.	1
Ill.	2
Ind.	1
Maine	2
Mass.	1
Mich.	1
Minn.	3
Nebr.	1
N. J.	3
N. Y.	3
Ohio	1
Ore.	1
Pa.	4
S. D.	1
Wis.	4

Figure I.



Distribution of 492 scores on Test A-1 (Reading ability.)

THE CONSTRUCTION OF A SCALE FOR SPEED OF WRITING IN SHORTHAND.

The usual way in which teachers of shorthand attempt to measure the speed of writing of their pupils is by dictating certain material to the class, gradually increasing the rate of dictation until they can barely succeed in "getting the dictation". This method is open to several objections. In the first place, it presupposes a "class", whereas in reality there is no such thing as a class. No two in the class can write at exactly the same rate of speed, except by a very remote chance, and yet this test presupposes that a group will be able to take the dictation at a given rate. The method would be more valid if applied to an individual, and even then the teacher should be in a position to see the pupil's notes, so as to know whether the pupil was "keeping after". Otherwise, if the dictation was too rapid, the pupil would be embarrassed and confused by the necessity for remembering the part dictated but not yet written, and the tendency would be cumulative in the direction of a decrease of efficiency, even below the real ability of the pupil.

The method is further open to the objection that the material dictated is not standardized. Its

difficulty is not known. The writer has seen classes struggling and growing discouraged, (a condition which is opposed to improvement), when they came upon a difficult section of their dictation book, made up of materials in "heavy" language, perhaps more or less technical. Being accustomed to write 100 words per minute, they now failed to maintain this speed, and were perhaps chided by the teacher for their failure to do what they should never have been expected to do. It would be well if the dictation practice exercises were somewhat standardized, so that in all cases, pupils and teachers might know what might reasonably be expected of them at their stage of advancement. But certainly tests should be on standardized materials.

In an effort to meet the first objection, teachers have sometimes given the class a passage in longhand, and asked them to transcribe it into shorthand. This may be a legitimate classroom procedure, but as a test it is in turn open to some objections. What does it test? Evidently reading ability and knowledge of the shorthand system as well as speed of writing. This ability and this knowledge are important, and well worthy of being tested or measured. But there is a time and place for everything. Certainly a good test

will not attempt to measure a number of different things at the same time.

The problem then is: how may a test be constructed to measure the student's ability to write shorthand rapidly, such that it will allow each student to work at his own rate of speed (he should not be confused by being compelled to write faster than he is able, nor should he find time hanging heavy upon his hands because the dictation is too slow to call forth the best speed that is in him), will employ standard materials of known difficulty, and afford standard scores for comparison?

To supply a standardized passage in ordinary type with directions that it be copied in shorthand is open to the objection that so much depends upon the pupil's knowledge of the system. Furthermore, much time would be consumed in looking back and forth, from the copy to the line of writing. One who knew the system well and could look back and forth readily without losing his place might win the highest score in such a test, even though he actually drew his outlines very slowly instead of really writing them. If the standardized passage were supplied in shorthand, with directions merely to copy it, the objections would be that the pupil must still look back and forth, hunting his place, and that furthermore much time may be lost in the

attempt to read the shorthand, for one can not write shorthand readily unless one knows the words and the letters he is writing.

It seemed, therefore, that the pupil should be supplied with the longhand of the passage to prevent his losing time in reading; that he should be supplied with the shorthand of the passage to prevent his gaining or losing anything in his speed of writing score by virtue of his superior or inferior knowledge of the system; and that both the longhand and the shorthand should be given him as he goes, at the rate of speed which just suits him, in such a way that he would not be compelled to look back and forth, hunting his place in the copy. These considerations suggested what has been called "the tri-interlinear device" of the tests B-1 and B-2, for speed of writing. It will be noticed that these tests provide three lines, one for the longhand, one for the shorthand, and a line of writing for the pupil's own notes. It is believed that these tests will more nearly isolate the function it is here desired to measure, speed of writing shorthand notes, than will any other sort of test that has been devised. One's eyesight is less taxed, not being required to find the place in the copy. Nothing depends upon one's hearing, as in the case of matter dictated.

One's score is not much affected by one's knowledge of the system, for the proper shorthand outlines are indeed "at his pencil's end", supplied in the test. Nothing depends upon memory, as in the case of a test dictated to a group. The writer has known cases where the inferior pupil came out ahead in such tests, simply because when the dictation came too fast they had the ability to store up much of it in memory, to write it later when the dictation was slower or had ceased. This, of course, is a very valuable ability for the practical stenographer, and should be cultivated if possible. But it should not be allowed to intrude when the purpose is to measure speed of writing pure and simple, or as pure and simple as may be possible.

Copies of the tests, keys, and class record sheets are given herewith. They include the necessary directions for giving and scoring the tests. It will be noted that by means of the key supplied to teachers, the tests may be scored in a very small fraction of a minute. In fact, the teacher might score the papers for a large class in less than five minutes. This is one great advantage of these tests. The resulting "pupil's score" is a score in words written per minute.

It has been reported to the writer that the fastest living writer of Gregg Shorthand tried these

FOLD OUT

D

Months

e signal is given.

lesired.

article is printed
py the shorthand
llow exactly two
ens immediately."

when the signal,

tests and found that he could not complete their four hundred words, or more, in the allotted time, two minutes, even though he could ordinarily take the same amount of material in dictation in less than two minutes. The obvious reply is that we are not claiming for these tests that they will give the same score that some other form of test will yield. The scores in dictation tests will probably be higher. All that need be claimed to establish the validity of these tests is that the relative scores of two or more persons who take the tests give a true idea of their relative ability so far as speed of writing is concerned. If they do this as well as other sorts of tests, and in addition supply standard scores, they have at least that to their credit. That no one can complete the tests in the time allowed is not at all disconcerting, but rather most gratifying. It was the purpose to provide more material than any one could finish. Otherwise those who finished before "time" was called would not be tested.

Tentative standard scores were published in September 1921 for the B-1 and B-2 tests as follows:

	B-1	B-2
Number of cases	281	265
Number of classes tested	17	15
Number of states represented	11	11
Median for those who had shorthand 1 yr.	55.9	69.1
For those who had shorthand 2 years	73	80.5

Tentative standard scores for the two forms of the B tests seem, at first sight, to indicate that B-2 is less difficult than B-1, inasmuch as the norms set for the two forms are approximately ten points higher for B-2 than for B-1. It would, of course, be very unfortunate if two forms of any test differed so widely in difficulty. The two selections were made with a view to having them of approximately equal difficulty. They were taken from the same book, by the same writer, and appear to be similar in style. There was evidence to show that in all the cases upon which these tentative norms were based, B-1 was given first, and B-2 second. There was a possibility, therefore, that the difference of ten points might be due to the effect of practice, especially in view of the fact that the test is quite different in its nature from anything the students were apt to have done before. Accordingly when the two forms of the B test were given to the ninety-six cases, as described elsewhere, they were given in the reverse order: B-2 before B-1. The result was that the median score for B-1 was found to be, not lower, but actually six points higher than the B-2 median. The practice-effect may have been more or less in this case than in other places. Taking these results as typical, however, they would indicate a difference in difficulty of only two points--an almost negligible difference. It is recommended that those using the tests should read the norms given for B-1 as the standards for the first use of a B test, and similarly for the norms given for B-2.

TABLE II-A.

DISTRIBUTION OF SCORES, AND MEDIANS ON TESTS B-1 AND B-2.

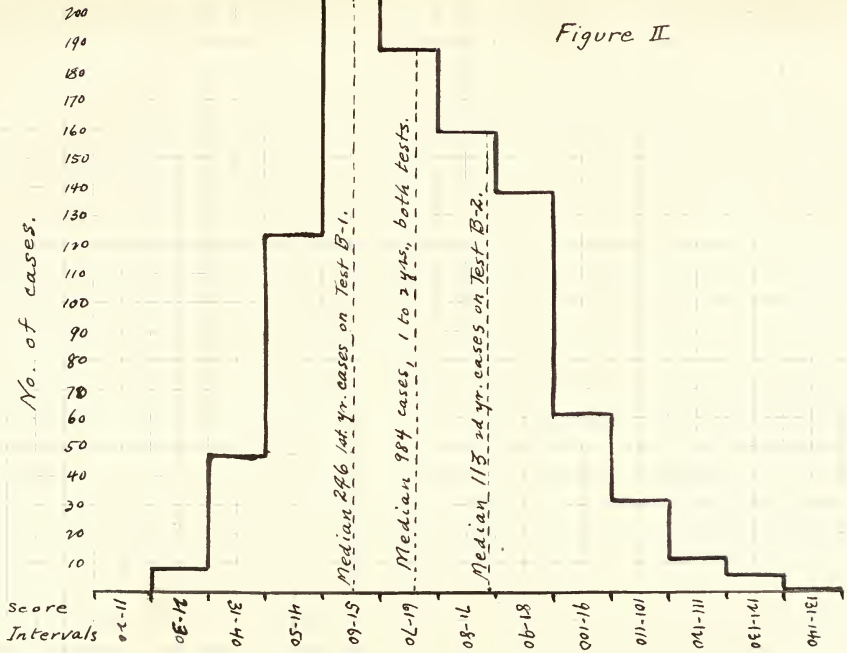
Class Intervals	Test B-1			Test B-2			
	1 year Group	1½yr. Group	2 year Group	1 year Group	1½ yr. Group	2 year Group	All Groups
131-140	1	0	0	0	0	0	1
121-130	2	0	0	0	1	3	6
111-120	2	1	0	1	6	2	12
101-110	2	6	4	6	5	9	32
91-100	1	13	10	9	12	16	61
81-90	7	15	28	32	32	24	138
71-80	17	32	19	50	14	27	159
61-70	50	24	20	62	17	15	188
51-60	75	24	27	58	12	12	208
41-50	58	17	11	28	6	4	124
31-40	25	9	7	4	1	1	47
21-30	6	1	1	0	0	0	8
11-20	0	0	0	0	0	0	0
No. cases	246	142	127	250	106	113	984
	515 cases			469 cases			
Medians	55.6	69.5	70.	66.6	82.1	79.3	66.6

TABLE II-B.

DISTRIBUTION OF CLASSES TESTED WITH B TESTS

Name of State	No. classes B-1	No. classes B-2
Conn.	3	3
Colo.	1	1
Ill.	2	1
Ind.	1	1
Maine	2	2
Mass.		1
Mich.	2	1
Minn.	4	3
Nebr.	1	1
N. J.	2	2
N. Y.	2	1
Ohio	1	1
Ore.	1	1
Pa.	4	4
S. D.	1	1
Wis.	5	5
Classes	32	29
States	15	16

Figure II



Distribution of 984 cases on tests B-1 and B-2 (Speed of Writing.)

THE VALIDITY AND RELIABILITY OF THE A AND B TESTS

Two questions which should be asked with regard to every test are: 1. Is it valid? 2. Is it reliable? In other words, the first question is whether the test measures the function it pretends to measure; the second question asks whether the test or the different forms of the test measure that function consistently. A test may be very interesting and very cleverly arranged, yet really useless if it does not measure the function it is intended to measure. Again, a test is comparatively worthless if it gives widely differing results on two or more successive applications. In that case we say it is not trustworthy, or not reliable. It is incumbent upon anyone who offers tests to teachers for their use to inform them as to the extent to which the tests may be trusted to do the thing they are said to do, and to do it consistently. To answer these questions a number of investigations have been made.

The Validity of Test A-1

In searching about for an absolute measure of reading ability, with which the results of the A test might be compared, so as to show its measure of validity, the author decided upon the plan of giving individual timed tests in reading. An arrangement was made with the Boys High School, Frederick, Md., whereby the boys of the Commercial Department were permitted to come to the office, one at a time. The writer met each boy,

explained to him the purpose of the work, and the fact that the results would not affect him in any way, thus trying to get the best possible rapport. The boy was then requested to begin reading aloud from a page of printed shorthand notes (Gregg Speed Studies, page 156, "Productive Employment"). Each reading was carefully timed with a stop-watch for three minutes, the number of the last word read was recorded. This number was regarded as a gross result, from which the number of words "prompted" was subtracted to get the net number of words read. In prompting the experimenter always allowed five seconds before giving the help. The net number of words read was divided by the number of minutes (three) to get the net number of words read per minute. These scores were thought worthy of being regarded fairly reliable measures of the pupils' reading ability.

Test A-1 was then used with this same group of boys, and after an interval of a week, used a second time. These two sets of scores were averaged and the average scores correlated with the individual timed reading scores. The resulting coefficient of correlation, using the Pearson formula, was .55 P. E. .08. The correlation with the first use of A-1 yields a somewhat lower coefficient, while with the second use of A-1 the coefficient of correlation is somewhat higher than that given. Furthermore, two or three of the brighter boys tried to "beat"

the test the second time they took it, by guessing at the word-choices, thus trying to accomplish a greater part of the work than they could otherwise do. Their guesses proved rather unfortunate. Inasmuch as the method of scoring the test calls for subtracting the number wrong from the number right, these boys received very low scores--much lower than on the first trial of the test, when they followed directions honestly. If these scores were left out of account, the coefficients of correlation would be nearly ten points higher, that is, approximately .65 with a correspondingly lower P. E. However, even the obtained coefficient, .55, is regarded as satisfactory evidence of the validity of the test. This statement needs to be qualified, however, by a recognition of the fact that the number of cases was perhaps too small (forty-one cases) to be conclusive.

The Reliability of the A Tests.

As mentioned above, test **A-1** was used twice with the group of forty-one boys, with approximately one week intervening between the two uses of the test. These two sets of scores were correlated to show the extent to which the test is reliable, or consistent in yielding the same sort of results on successive trials. The self-correlation of test A-1 was found to be that expressed by the Pearson coefficient .80, P. E. .04. This coefficient seems quite satisfactory, though here again it needs to be remembered that the number of cases was rather small.

The author's experience in the use and the scoring of the A-1 test indicates that while the results secured from the first use of the test are good, the second use of the same test yields somewhat better and more reliable scores. This appears to be due to the fact that the nature of test is "strange" to the pupils. On the second trial they get the "swing" of it and do themselves justice. The same remarks apply with equal force to the B tests. Experience with the results in those cases where pupils, knowing the author personally, tried to "beat" his test by guessing at the word-choices, justifies those who use the test in warning the class that the test and its scoring are such that "the cards are stacked" against those who guess. The chances are that they will make better scores by honest work than by guessing. Teachers can very readily tell when guessing has been resorted to. Given the context, the word-choices are of approximately zero difficulty. Honest papers usually show no mistaken choices, so far as they go. Or at most, they may show one or two mistaken choices. When pupils guess they will have a much larger and very noticeable number of mistakes.

The Validity of the B Tests.

Miss Brewington of the University of Chicago gave a group of thirty-four pupils two forms of the B test. To the same group was assigned the task of copying familiar printed shorthand from a page of a text-book for three

minutes. All scores were reduced to a words-per-minute basis. The B-1 and B-2 scores were averaged, and the average scores correlated with the scores derived from the timed readings from good, printed shorthand notes. The Pearson coefficient of correlation was found to be .51 with a P. E. of .09. The correlations with either of the B tests alone were approximately the same. This coefficient is worthy of some consideration as showing the validity of the tests, though the number of cases must be admitted to be too small.

A similar test was made in the High Schools of Frederick, Md. Ninety-six pupils were given the two forms of the B test. They were also given an original test, which may be described as follows: A selection of fifty words from "Rip Van Winkle" was written on the blackboard in good shorthand notes.

> "He was observed at first to vary on some points every time he told it, which was doubtless owing to his having so recently awaked. It at last settled down precisely to the tale I have related; and not a man, woman, or child in the neighborhood but knew it."

The teachers then read the shorthand to the class and had them copy it three times for practice and to familiarize them with the text and the outlines. Practice papers were then laid aside and the pupils told to write the matter as often and as rapidly as they could for three minutes. The teachers gave the signals: "start" and "stop" and kept the time carefully. Papers were then collected and scored, in words per minute.

The correlation of the scores on this original test with the average scores made on the two forms of the B test yields the coefficient .73 P. E. .03. This coefficient is regarded as quite satisfactory and the number of cases as fairly large. These results tend to show the validity of the B tests. Taken together with the results secured by Miss Brewington, they show that the B tests will give in a few minutes scores very similar to those derived from other, unstandardized tests devised with a view to measuring the same function, speed of writing. The B tests have the advantage of being more convenient, requiring less time to administer and score, and affording standard scores for comparative purposes.

The Reliability of the B Tests.

Scores received from Miss Brewington on the two forms of the B test for fifty-seven individuals, show a self-correlation expressed by the Pearson coefficient .83 with a P. E. of .03.

Self-correlation of the ninety-six scores on the two forms of the B test administered in the Frederick High Schools is found to be .87, P. E. .02.

Here we have a fairly large number of cases (one hundred and fifty three in all) and a close agreement between the two coefficients, tending to show that the true degree of self-correlation will probably be found to be between .80 and .90, or at any rate, high enough to justify the B tests from the standpoint of their reliability.

TABLE III.

Scores Correlated	No. cases	r	P.E.
Average of two scores on A-1 with stop-watch-times individual test	41	.55	.08
Self-correlation of A-1	41	.80	.04
Average of B-1 and B-2 with copying from text-book 3 min. (Chicago)	34	.51	.09
Average of B-1 and B-2 with writing familiar text 3 min. (Frederick)	96	.73	.03
B-1 with B-2 (Chicago)	57	.83	.03
B-1 with B-2 (Frederick)	96	.87	.02

THE CONSTRUCTION OF A SCALE FOR SHORTHAND PENMANSHIP

For the purpose of constructing a scale for the measurement of the quality of Gregg Shorthand penmanship, a collection of specimens of shorthand was made in a uniform way. From "The Legend of Sleepy Hollow" and "Rip Van Winkle", both from Irving's "Sketch Book", two hundred and fifty four selections were made, of exactly fifty words each. These selections were cut from the books and glued upon cards three by six inches in size, both in the shorthand and in the longhand. These cards were distributed to pupils in various schools, together with a sheet five and one-half by eight and one-half inches, upon which were printed the outlines of two squares, three by three and one-half inches each, together with the directions:

"Number_____. (Write here the number given on the card.) Copy the shorthand given on the card in the upper space first, then again in the second space.

The purpose was to regard the first writing as practice, and to use the second in the actual construction of the scale. Most of the cards were copied by four different individuals. By means of the number at the top of the page each specimen can be identified, and by turning to the card with the corresponding number the key to the shorthand may be found.

Teachers were instructed to allow pupils to use either pen or pencil and to allow them sufficient time so that all might finish. They were also instructed to secure specimens from all pupils, regardless of the degree of proficiency or advancement in shorthand.

In this way eleven hundred and fifty-five specimens were secured. The names of the schools and the number of specimens secured from each are as follows:

Western High School, Baltimore	615
High School of Commerce, New York	165
Schenley High School, Pittsburgh	96
The Baltimore Business College	79
Baltimore City College	25
Girls' High School, Frederick, Md.	50
Boys' High School, Frederick, Md.	42
The Harrisburg (Pa.) Shorthand School	38
The Lancaster (Pa.) Business College	36
Individuals	3
The Gregg Publishing Company	6
Johns Hopkins University, Summer Session	20

The six specimens secured from the Gregg office were written by experts. The twenty specimens secured in the University Summer Session were written by persons, none of whom had ever had any instruction in shorthand whatsoever. These twenty-six specimens were secured in this way after it had been found that the more than eleven hundred specimens contained few if any that were good enough for the upper

end of the scale, or ~~and~~ poor enough for the lower end.

The entire eleven hundred and fifty specimens were graded by five judges. The judges were told to sort the specimens into five piles, very good, good, medium, poor, and very poor, in such a way that approximately one half of the entire number would be in the middle or medium group, about forty specimens each in the very good and very poor groups, with the rest about equally divided between the good and the poor. In other words, a normal distrubution was assumed, with the precentages for the five groups approximately three, twenty-two, fifty, twenty-two, and three. It was felt that this would assist the judges in giving a better rating than would probably be the case without such guidance.

The five judgments on each specimen were then averaged and on this basis a selection was made of approximately forty one specimens of each grade, very good, good, medium, poor, and very poor. This meant that in all only two hundred and five specimens were retained for further grading, while the great bulk, eight hundred and fifty specimens, representing a surplus ~~from~~ of material at about the middle part of the scale, could be at once discarded. It was believed that the two hundred and five specimens, so selected, would include an adequate number for each step of the scale.

Twelve additional judgments were then secured for the two hundred and five specimens, in accordance with the following directions:

DIRECTIONS FOR GRADING 205 SPECIMENS OF SHORTHAND

Preliminary: SHUFFLE thoroughly like cards.

I.

Sort the 205 specimens into five piles (A, B, C, D, E, or Very Good, Good, Medium, Poor, Very Poor) so that there are not less than 34 nor more than 44 in any one pile. If there are more or less than these numbers in any pile, re-sort the larger piles at least in part.

II.

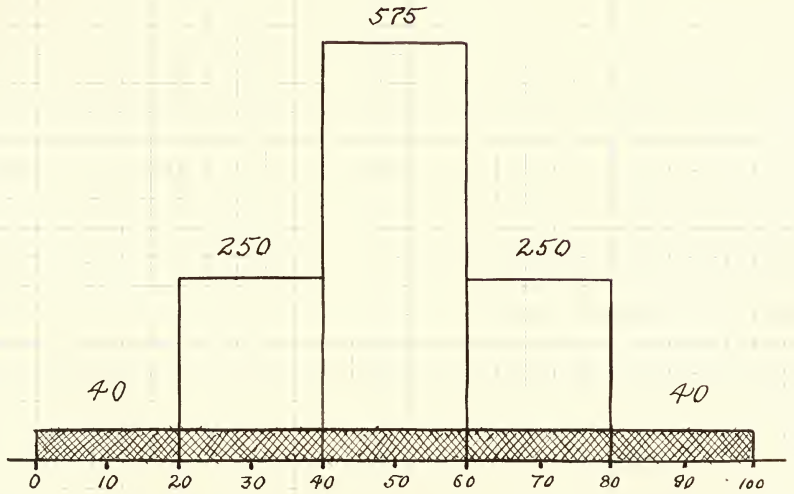
Re-sort each of the five piles into two, so that you get the better and the worse halves, with not over 25 or under 15 in each half. This step will give you ten piles, from the worst, which we will arbitrarily call 1, to the best which we will call 10.

III.

Turn each of the ten piles over and write on the back of each paper, under the numbers already there, at the left hand edge, its score (i.e., 1,2,3,4,5,6,7,8,9, or 10). SHUFFLE.

Here the assumption was that there were approximately an equal number of specimens representing each of the five groups. For this reason the directions were given for the guidance of the judges in such a way as to rule out of account their personal opinions as to the absolute quality of the specimens. What was wanted was their judgment as to the relative qualities of the specimens.

Figure III



Graph of plan for securing selection of 200 specimens equally distributed over scale.

950 specimens discarded after five judgments.

205 specimens retained after five judgments, for still further judging.

There were now five and twelve, or, in all, seventeen judgments recorded for each specimen. With the aid of an adding machine these seventeen judgments were averaged, counting the digits as tens (thus 6 would count as 60), and counting the values of the five groups of the original judgments as 90, 70, 50, 30, and 10. The values of the two hundred and five specimens secured by thus adding their points are given in Table IV .

From the two hundred and five specimens, so evaluated, forty specimens were now selected, such that their point values differed by thirty or forty points. By this proceedure it was believed that a series of specimens was secured, ranging, by approximately equal steps in value, from the very poorest, of approximately zero value, to the very best, a specimen of perfect shorthand, written by an expert, the value of which is approximately one hundred. In Table IV the forty specimens selected from the two hundred and five are indicated by the symbol "#".

These forty specimens were then engraved and five hundred and fifty duplicate sets struck off, which were mailed to as many different teachers of shorthand all over the United States, with the request that they judge them in accordance with the following directions:

TABLE IV

Values of the 205 Specimens in Total Points Credit Given by 17 Judges.

1620#	1350	990#	750	440#
1620	1350	980	740	440
1620	1340	980	720#	430
1610	1340	960	720	430
1610	1320#	960	720	430
1600	1290#	950#	720	430
1600	1280	940	700#	400#
1590#	1250	940	690	390
1590	1250	930	680	380
1580	1250#	920	680	360#
1570	1240	920	680	350
1570	1240	920#	680	350
1560	1240	910	670	330#
1560	1230	900	670	330
1550	1230	900	670	290#
1540#	1230	890	670	280
1540	1220#	890	660#	280
1530	1220	880	650	270
1530	1200	880#	650	270
1510#	1190	870	640	260
1500	1180#	860	640	260
1490	1170	860	630	260#
1490	1160	860	620#	250
1490	1150	850	590	240
1460	1140#	850	580#	240
1450#	1130	840#	570	240
1450	1130	840	570	240
1440	1120	840	560	230
1440	1110	840	560	230
1440	1110#	830	550#	230
1440	1110	830	550	220
1430	1090	810#	540	220#
1420#	1080	800	540	200
1410	1080	790	510#	190
1400	1070#	790	500	180
1400	1050	790	490	170
1400	1050	790	490	170
1390#	1020#	790	480#	170
1390	1010	790	480	170
1360	1000	760#	450	170
1360#	990	750	450	170#

(Note: The symbol "#" is used to indicate those specimens which were included in the selection of forty.)

TO GREGG SHORTHAND TEACHERS:

For nearly two years I have been working on a scale for measuring the quality of Shorthand Penmanship. Now I have reached the stage in my work when I must send this appeal for cooperation to 500 teachers of Gregg Shorthand.

Some time in January the completed scale will be ready. A copy will be sent you gratis in return for your cooperation.

I wish to have the 40 specimens sent you herewith graded from the standpoint of their quality or general merit as shorthand penmanship. Will you please cooperate with me in this work by giving me the benefit of your judgment.

THE FOLLOWING PLAN IS SUGGESTED:

1. Sort the forty specimens into five groups of about eight specimens each, as follows: VERY POOR, POOR, MEDIUM, GOOD, VERY GOOD.

2. Now take each of these groups in turn and divide it into the better and worse halves. This will give you ten groups of four specimens each.

3. Take up one group after the other and arrange the four specimens from the standpoint of their merit as shorthand penmanship.

4. When you have gone through each group in this way you will have arranged the entire forty specimens in such a manner that the best is on top and the worst on the bottom, with the others graduated all the way between.

5. Put the specimens, arranged in this order from best to worst, in the return envelope, and post.

May I assure you your cooperation in this matter will be greatly appreciated.

Sincerely yours,
(Signed)

When the time arrived that the judgments should be in hand, it was found that 250 teachers had responded by arranging the specimens in the order of their quality from the best to the worst, and returning them in this order. The resulting data are given in Table V in which the judges are indicated by the numbers at the left hand margin, from 1 to 300, and the ranks by the numbers at the top of the table, from 1 to 40. The main body of the table is made up of numbers which signify the several specimens, to which the numbers from 1 to 40 were assigned in a purely chance order.

After the results were compiled for the first 250 judges to report, the average rank of each of the specimens was computed with the aid of a calculating machine. This was done in order to ascertain the relative values or ranking of the specimens. The result is shown in Table VI.

A considerable number of judges reported less promptly. Fifty of these were later included in the study, making 300 in all, as appears in Table V. It was now possible to count the number of judges who considered each specimen superior to the next best, and then, with the aid of the table given by Thorndike in his Mental and Social Measurements (pp. 122-123, Table 23) to ascertain the differences in the values of the specimens in terms of P. E. This method is based upon the theory that "equally often noticed differences are equal." The amounts of difference are shown in Table VII.

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TABLE VI

AVERAGE RANK OF 40 SPECIMENS OF SHORTHAND

No. of Specimen	Average Rank
11 #	1.872
32 #	3.164
23 #	4.260
24 #	6.104
27 #	6.988
28 #	9.282
26	10.736
17	10.960
38 #	11.052
3	12.152
2	12.592
13 #	13.744
15	14.512
12	15.392
34 #	15.692
20	16.768
18	17.072
30	17.912
22	17.964
33 #	18.780
4	20.408
10	20.672
19	20.796
5	21.148
9 #	21.180
37	25.484
36 #	25.516
40	28.020
8 #	29.628
14	31.156
25	31.164
1	32.480
6 #	32.556
31	32.980
7	33.464
39	33.492
29	34.076
16	34.220
35 #	34.620
21 #	39.812

# indicates the specimens included on the scale.

TABLE VII

VALUES OF THE 40 SPECIMENS.

Number of specimen	Considered better than	Number of judges in 300	Per cent of better judgm'ts	Per cent of worse judgm'ts	Amount of difference	Value in terms of P.E.
11	32	218	72.7	27.3	.90	11.53
32	23	177	59.	41.	.34	10.63
23	24	196	65.3	34.7	.58	10.29
24	27	202	67.3	32.7	.66	9.71
27	28	199	66.3	33.7	.62	9.05
28	26	159	53.	47.	.11	8.43
26	17	161	53.7	46.3	.14	8.32
17	38	150	50	50	.00	8.18
38	3	164	54.7	45.3	.18	8.18
3	2	167	55.7	44.3	.21	8.00
2	13	166	55.3	44.7	.20	7.79
13	15	153	51.	49.	.04	7.59
15	12	176	58.7	41.3	.33	7.55
12	34	150	50.	50.	.00	7.22
34	20	172	57.3	42.7	.27	7.22
20	22	166	55.3	44.7	.20	6.95
22	18	152	50.7	49.3	.03	6.75
18	30	155	51.7	48.3	.06	6.72
30	33	174	58.	42.	.30	6.66
33	4	176	58.7	41.3	.33	6.36
4	5	170	56.7	43.3	.25	6.03
5	19	152	50.7	49.3	.03	5.78
19	10	157	52.3	47.7	.08	5.75
10	9	159	53.	47.	.11	5.67
9	37	208	69.3	30.7	.75	5.56
37	36	159	53.	47.	.11	4.81
36	40	179	59.7	40.3	.37	4.70
40	8	159	53.	47.	.11	4.33
8	25	181	60.3	39.7	.39	4.22
25	14	160	53.3	46.7	.12	3.83
14	6	171	57.	43.	.26	3.71
6	31	152	50.7	49.3	.03	3.45
31	1	154	51.3	48.7	.05	3.42
1	7	157	52.3	47.7	.08	3.37
7	39	152	50.7	49.3	.03	3.29
39	29	161	53.7	46.3	.14	3.26
29	35	173	57.7	42.3	.29	3.12
35	16	153	51.	49.	.04	2.83
16	21	291	97.	3.	2.79	2.79
21					0	0

In connection with his explanation of this method Thorndike says: "The method as a whole presupposes that the observations are made by judges of some competence. Its precision depends upon how competent they are." Something needs, therefore, to be said with reference to the judges employed in this work.

When the Gregg Publishing Company called upon teachers of shorthand to lend their aid in the construction of shorthand scales and tests, about four hundred responded, expressing their willingness to try such tests and cooperate in their development. This was a very gratifying response, and would seem to indicate on the part of these teachers some degree of understanding of the nature and value of standard measures, as well as a spirit of willingness. Believing that no more capable, intelligent, and willing body of judges could be found, the writer decided to invite the cooperation of these teachers in judging the specimens. The 150 additional sets were sent, for the most part, to shorthand teachers in the schools of certain large cities, notably Baltimore and Los Angeles. A few were sent to individuals known to be expert in shorthand. Many expressions of interest were received from the judges. A number reported that the work was difficult. All indications seemed to point to the fact that in general the judges performed their work in a most careful and intelligent manner. The geographical distribution of judges is given in Table VIII.

TABLE VIII

GEOGRAPHICAL DISTRIBUTION OF JUDGES

State	No. of Judges
Arizona	3
Alabama	1
California	23
Colorado	5
Connecticut	3
Delaware	1
Florida	2
Idaho	1
Illinois	32
Indiana	7
Iowa	9
Kansas	3
Minnesota	10
Montana	1
Maine	8
Massachusetts	19
Missouri	3
Michigan	18
Mississippi	1
Maryland	27
Nebraska	6
New Mexico	1
North Dakota	1
New Hampshire	2
New Jersey	13
New York	26
Ohio	9
Oregon	4
Oklahoma	1
Pennsylvania	19
Rhode Island	4
South Dakota	1
Tennessee	1
Texas	5
Vermont	4
Virginia	2
Washington	8
Wisconsin	15
Canada	1
TOTAL	300

KEY TO THE TEXT OF THE 40 SPECIMENS OF SHORTHAND

1.

Balt Van Tassel was an easy, indulgent soul. He loved his daughter better even than his pipe, and, like a reasonable man and an excellent father, let her have her way in everything. His notable little wife, too, had enough to do to attend to her housekeeping and manage the

2.

But it is meet I should, in the true spirit of romantic story, give some account of the looks and equipments of my hero and his steed. The animal he bestrode was a broken-down plow-horse, that had outlived almost everything but his viciousness. He was gaunt and shagged, with

3.

Oh, she too had died but a short time since. She broke a blood-vessel in a fit of passion at a New England peddler. There was a drop of comfort, at least, in this intelligence. The honest man could contain himself no longer. He caught his daughter and her

4.

Farther on he beheld great fields of Indian corn, with its golden ears peeping from their leafy coverts, and holding out the promise of cakes and hasty pudding; and the yellow pumkins lying beneath them, turning up their fair, round bellies to the sun, and giving ample prospects of the

5.

A sloop was loitering in the distance, dropping slowly down with the tide, her sail hanging uselessly against the mast; and, as the reflection of the sky gleamed along the still water, it seemed as if the vessel was suspended in the air. It was toward evening that Ichabod arrived

6.

How solemnly they would listen to the contents, as drawled out by Derrick Van Bummel, the schoolmaster,—a dapper, learned little man, who was not to be daunted by the most gigantic word in the dictionary! And how sagely they would deliberate upon public events some months after they had

7.

In the fullness of their revelry, they fluttered, chirping and frolicking, from bush to bush, and tree to tree, capricious from the very profusion and variety around them. There was the honest cock-robin, the favorite game of stripling sportsmen, with its loud, querulous note; and the twittering blackbirds flying

8.

Just sufficient time had elapsed to enable each story-teller to dress up his tale with a little becoming fiction, and, in the indistinctness of his recollection, to make himself the hero of every exploit. There was the story of Doffue Martling, a large, blue-bearded Dutchman, who had nearly taken

9.

Your mere puny stripling, that winced at the least flourish of the rod, was passed by with indulgence; but the claims of justice were satisfied by inflicting a double portion on some little, tough, wrong-headed, broad-skirted Dutch urchin, who sulked and swelled and grew dogged and sullen beneath

10.

Balt Van Tassel was an easy, indulgent soul. He loved his daughter better even than his pipe, and, like a reasonable man and an excellent father, let her have her way in everything. His notable little wife, too, had enough to do to attend to her housekeeping and manage the

11.

But the thought and feeling embodied in the words of great writers during the so-called classic days of Greece and Rome are truly and splendidly alive today for the simple reason that they were alive then; and are so true to the universal experience of mankind and so beautiful in (50) their expression that Time cannot touch them nor age wither their "infinite variety".

12.

Then, as he wended his way, by swamp and stream and awful woodland, to the farmhouse where he happened to be quartered, every sound of nature, at that witching hour,

fluttered his excited imagination,—the moan of the whip-poor-will from the hillside; the boding cry of the tree-toad, that harbinger

13.

Brom Bones, however, was the hero of the scene, having come to the gathering on his favorite steed Daredevil,—a creature, like himself, full of mettle and mischief, and which no one but himself could manage. He was, in fact, noted for preferring vicious animals, given to all kinds of

14.

Times grew worse and worse with Rip Van Winkle as years of matrimony rolled on. A tart temper never mellows with age, and a sharp tongue is the only edged tool that grows keener with constant use. For a long while he used to console himself, when driven from home

15.

As he was a bachelor, and in nobody's debt, nobody troubled his head any more about him. The school was removed to a different quarter of the hollow, and another pedagogue reigned in his stead. It is true, an old farmer, who had been down to New York on a

16.

Something, however, I fear me, must have gone wrong; for he certainly sallied forth, after no very great interval, with an air quite desolate and chopfallen. Oh these women, these women! Could that girl have been playing off any of her couquettish tricks? Was her encouragement of the poor pedagogue

17.

Streaming files of wild ducks began to make their appearance high in the air. The bark of the squirrel might be heard from the groves of beech and hickory nuts, and the pensive whistle of the quail at intervals from the neighboring stubble-field. The small birds were taking their

18.

Then, as he wended his way, by swamp and stream and awful woodland, to the farmhouse where he happened to be quartered, every sound of nature, at that witching hour, fluttered his excited imagination,—the moan of the whip-poor-will from the hillside; the boding cry of the tree-toad, that harbinger

19.

His rusty mane and tail were tangled and knotted with burrs. One eye had lost its pupil, and was glaring and spectral, but the other had the gleam of a genuine devil in it. Still he must have had fire and mettle in his day, if we may judge from

20.

An opening in the trees now cheered him with the hopes that the church bridge was at hand. The wavering reflection of a silver star in the bosom of the brook told him that he was not mistaken. He saw the walls of the church dimly glaring under the trees

21.

This story was immediately matched by a thrice marvelous adventure of Brom Bones, who made light of the Galloping Hessian as an arrant jockey. He affirmed, that, on returning one night from the neighboring village of Sing Sing, he had been overtaken by this midnight trooper; that he had offered

22.

The schoolhouse, being deserted, soon fell to decay, and was reported to be haunted by the ghost of the unfortunate pedagogue; and the plow-boy, loitering homeward of a still summer evening, has often fancied his voice at a distance, chanting a melancholy psalm tune among the tranquil solitudes of

23.

There are three sorts of actions; those that are good, those that are bad, and those that are doubtful, and we ought to be cautious of those that are doubtful; for we are in most danger of these doubtful actions, because they do not alarm us, and yet they insensibly (50) lead to greater transgressions, just as the shades of twilight gradually reconcile us to darkness.

24.

The opinions of this junto were completely controlled by Nicholas Vedder, a patriarch of the village, and landlord of the inn, at the door of which he took his seat from morning till night, just moving sufficiently to avoid the sun, and keep in the shade of a large tree

25.

He had overheard the boast of Bones, that he would "double the schoolmaster up and put him on a shelf;" and he was too wary to give him an opportunity. There was something extremely provoking in this obstinately pacific system: it left Brom no alternative but to draw upon the

26.

His schoolhouse was a low building of one large room, rudely constructed of logs; the windows partly glazed, and partly patched with leaves of old copy-books. It was most ingeniously secured at vacant hours by a withe twisted in the handle of the door, and stakes set against the window-shutters;

27.

As to Rip's son and heir, who was the ditto of himself, seen leaning against the tree, he was employed to work on the farm, but evinced an hereditary disposition to attend to anything else but his business. Rip now resumed his old walks and habits. He soon found many

28.

The poor fellow was now completely confounded. He doubted his own identity, and whether he was himself or another man. In the midst of his bewilderment, the man in the cocked hat demanded who he was, and what was his name. "God knows!" exclaimed he, at his wits' end. "I'm

29.

Such heaped-up platters of cakes of various and almost indescribable kinds, known only to experienced Dutch housewives! There was the doughty doughnut, the tender oly-koek, and the crisp and crumbling cruller; sweet cakes and short cakes, ginger cakes and honey cakes, and the whole family of cakes; and then there

30.

There was a whisper, also, about securing the gun, and keeping the old fellow from doing mischief, at the very suggestion of which the self-important man in the cocked hat retired with some precipitation. At this critical moment a fresh, comely woman pressed through the throng to get a

31.

Dame Van Winkle regarded them as companions in idleness, and even looked upon Wolf with an evil eye, as the cause of his master's going so often astray. True it is, in all points of spirit befitting an honorable dog, he was as courageous an animal as ever scoured the

32.

Certain it is, the place still continues under the sway of some witching power, that holds a spell over the minds of the good people, causing them to walk in a continual reverie. They are given to all kinds of marvelous beliefs; are subject to trances and visions; and frequently

33.

They are like those little nooks of still water which border a rapid stream, where we may see the straw and bubble riding quietly at anchor, or slowly revolving in their mimic harbor, undisturbed by the rush of the passing current. Though many years have elapsed since I trod the

34.

Fain would I pause to dwell upon the world of charms that burst upon the enraptured gaze of my hero, as he entered the state parlor of Van Tassel's mansion; not those of the bevy of buxom lasses, with their luxurious display of red and white, but the ample charms

35.

He assisted the farmers occasionally in the lighter labors of their farms, helped to make hay, mended the fences, took the horses to water, drove the cows from pasture, and cut wood for the winter fire. He laid aside, too, all the dominant dignity and absolute sway with which he

36.

The gallant Ichabod now spent at least an extra half hour at his toilet, brushing and furbishing up his best and indeed only suit of rusty black, and arranging his looks by a bit of broken looking-glass that hung up in the schoolhouse. That he might make his appearance

37.

His rusty mane and tail were tangled and knotted with burrs. One eye had lost its pupil, and was glaring and spectral, but the other had the gleam of a genuine devil in it. Still he must have had fire and mettle in his day, if we may judge from

38.

"I am your father!" cried he,—"young Rip Van Winkle once, old Rip Van Winkle now! Does nobody know poor Rip Van Winkle?" All stood amazed, until an old woman, tottering out from among the crowd, put her hand to her brow, and, peering under it in his face for a

39.

These magic books and the poetic scrawl were forthwith consigned to the flames by Hans Van Ripper, who from that time forward determined to send his children no more to school, observing that he never knew any good come of this same reading and writing. Whatever money the schoolmaster possessed,

40.

He was always ready for either a fight or a frolic; had more mischief than ill will in his composition; and, with all his overbearing roughness, there was a strong dash of waggish good-humor at bottom. He had three or four boon companions of his own stamp, who regarded

FOLD OUT

FOLD OUT

FOLD OUT

FOLD OUT

FOLD OUT

Table VII gives the values of the 40 specimens of shorthand in terms of P. E. From inspection of this table it now became possible to select specimens in such a way that they would differ from eachother in value by approximately five points, on a scale of 100 points. Thus were selected the sixteen specimens whose values appear on Table IX. This table should be read as follows: Specimen No. 11 is considered better than specimen No. 32 by 218 out of 300 judges. That is, 72.7 per cent of the judges consider it better, or 27.3 per cent consider it worse. By reference to the table it is found that 27.3 per cent of worse judgments corresponds to a difference in value of .90 P. E. This, added to the value of No. 32 (10.51) gives No. 11 a value of 11.41. In order to raise these values to a scale of 100 points, one P. E. is taken to be 8.25 points. All the values as given in the seventh column of the table are therefore multiplied by 8.25 to get the values in the eighth column. In the case of No. 11 this value is 94.13. The nearest whole number is 94. The value assigned this specimen on the scale is 95.

Specimen number 21 was written by a person who knew nothing of shorthand. It is clearly intended to be shorthand, though illegible as such. Its value is assumed to be zero.

It may, perhaps, be noticed that the values assigned the specimens in Table VII and Table IX vary somewhat. This fact requires an explanation. It is due to the fact that in the latter table the specimens are taken, not in the order of their rank, but in some of the steps one or more specimens are passed over. In the first table specimen 28 is compared with 26, and considered superior by 53 per cent of the judges. In the latter table 28 is compared with 38, and found superior by 61.3 per cent of the judges, making the difference in value between 28 and 38 in the latter table .42 P. E., whereas in the former table their difference is the sum of three steps of difference, .11, .14 and .00, or .25.

The fact of the existence of these differences might at first sight seem to invalidate the method. In reality the facts appear to justify the conclusion that the judging has in this case been very well done. A comparison of the values assigned the specimens in the two tables will show that the largest variation is .31 P. E. The fact that this variation is so small argues the care and precision with which the work of the judges has been done. In any event, the variations are so small, as they affect the scale, that they will not mar its practical value. In other words, the differences are so small as probably to fall below the power of human discernment.

TABLE IX

VALUES OF SPECIMENS INCLUDED IN SCALE

Specimen No.	In considered better than No.	Number of judges out of 300	Per cent of better judgments	Per cent of worse judgments	Amount of difference	Value of specimens in terms of P. E.	Differences times 8.25	Value in terms of nearest whole number	Values assigned on scale
11	32	218	72.7	27.3	.90	11.41	94.13	94	95
32	23	177	59.	41.	.34	10.51	86.71	87	90
23	24	196	65.3	34.7	.58	10.17	83.90	84	85
24	27	202	67.3	32.7	.66	9.59	79.12	79	80
27	28	199	66.3	33.7	.62	8.93	73.67	74	75
28	38	184	61.3	38.7	.42	8.31	68.56	69	70
38	13	198	66.	34.	.61	7.89	65.09	65	65
13	34	179	59.7	40.3	.37	7.28	60.06	60	60
34	33	212	70.7	29.3	.81	6.91	57.01	57	55
33	9	186	62.	38.	.45	6.10	50.32	50	50
9	36	201	67.	33.	.65	5.65	46.61	47	45
36	8	207	69.	31.	.74	5.00	41.25	41	40
8	6	201	67.	33.	.66	4.26	35.14	35	35
6	35	194	64.7	35.3	.56	3.61	29.78	30	30
35	21	294	98	2	3.05	3.05	25.16	25	25
21					0	0	0	0	0

FOLD OUT

Totals

CLASS RECORD SHEET

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To be used with the MEASURING SCALE FOR SHORTHAND PENMANSHIP

City..... State..... Date.....

School..... Teacher..... Grade.....

See other side for directions.

This class has studied shorthand ..... weeks.

Score for Quality	Score for speed in words per minute																Totals
	0–10	11–20	21–30	31–40	41–50	51–60	61–70	71–80	81–90	91–100	101–110	111–120	121–130	131–140	141–150	over 150	
95																	
90																	
85																	
80																	
75																	
70																	
65																	
60																	
55																	
50																	
45																	
40																	
35																	
30																	
25																	
under 25																	
Totals																	

Send one copy of this sheet to the Gregg Publishing Company, New York City

an improvement of 39.2 per cent in one year.

DIRECTIONS

Write the following sentence on the blackboard *in shorthand:*

"Fourscore and seven years ago our fathers brought forth upon this continent a new nation, conceived in liberty, and dedicated to the proposition that all men are created equal."

Have the pupils write this three times for practice, to familiarize them with the text and the shorthand. Collect these papers.

See to it that all have paper and two pencils (or fountain pen). Then say: "DO NOT WRITE ANYTHING UNTIL I GIVE YOU THE SIGNAL TO START. YOU WILL HAVE THREE MINUTES IN WHICH TO WRITE THE SENTENCE AS OFTEN AS YOU CAN. BE CAREFUL TO WRITE AS WELL AS YOU CAN. YOU WILL BE RATED BOTH FOR SPEED AND FOR QUALITY. START AND STOP PROMPTLY WHEN THE SIGNALS ARE GIVEN. ALL READY. START!" Keep the time very carefully, using a watch with a second-hand, allowing *exactly* three minutes. "STOP!" Collect the papers.

The score for speed is ascertained by multiplying 29 by the number of times the sentence has been completely written, adding the number of the last word written. This is the total number of words written and should be divided by three to get the score for speed in words per minute. Write this score in the upper right-hand corner of the paper.

When all have been scored in this way, score the papers for quality by the use of the scale, writing this score under the score for speed.

Enter the scores on the class record sheet by making a tally-mark in the square under the proper score for speed and opposite the score for quality. Total these scores both ways.

The sixteen specimens so selected were finally arranged for publication in the form of a scale, a copy of which, together with a copy of the Class Record Sheet prepared for use with the same, is included herewith. Copies of the scale and record sheets were promptly sent to the three hundred teachers and others who had judged the specimens, with the request that they use the scale as per directions given on the Class Record Sheet, and report the results on a duplicate of said sheet. Such reports were secured for 700 cases from the first thirty-three teachers reporting. A study of these results is given in the tables and graphs that follow.

The graphs indicate a normal distribution of the scores for speed, but a very much skewed distribution of scores for quality, with a marked tendency to give too many of the very high scores, 85, 90 and 95. This is probably due largely to the fact that those who have used this scale are for the most part persons who have not had previous training in the use of a quality scale. It is probable, furthermore, that the habit of giving grades of 90 to 95 in high schools, carries over here in spite of the scale.

The median scores for quality (80.5 and 82.6) show an improvement of only 2.6 per cent in one year's work, whereas the median scores for speed (43.1 and 60.) show an improvement of 39.2 per cent in one year.

TABLE X

QUALITY OF PUPILS' SHORTHAND NOTES

Scale Scores	No. of cases Group I.	No. of cases Group II.
95	58	31
90	67	36
85	80	56
80	56	36
75	59	36
70	39	14
65	30	6
60	10	7
55	12	8
50	13	5
45	7	5
40	15	4
35	6	0
30	3	1
25	1	0
under 25	0	0
Total no. of cases	456	245
Median scores	80.5	82.6

TABLE XI

SPEED OF PUPILS' SHORTHAND NOTES

Scores in words per min.	No. of cases Group I.	No. of cases Group II.
121-130	0	0
111-120	0	1
101-110	0	2
91-100	2	7
81-90	1	19
71-80	13	32
61-70	40	60
51-60	74	71
41-50	142	30
31-40	130	19
21-30	52	3
11-20	2	1
0-10	0	0
Total no. of cases	456	245
Median scores	43.1	60.

(Note: Group I had 28 weeks of instruction; Group II, 65 weeks.)

Figure XLIV

Speed of Writing (701 cases)

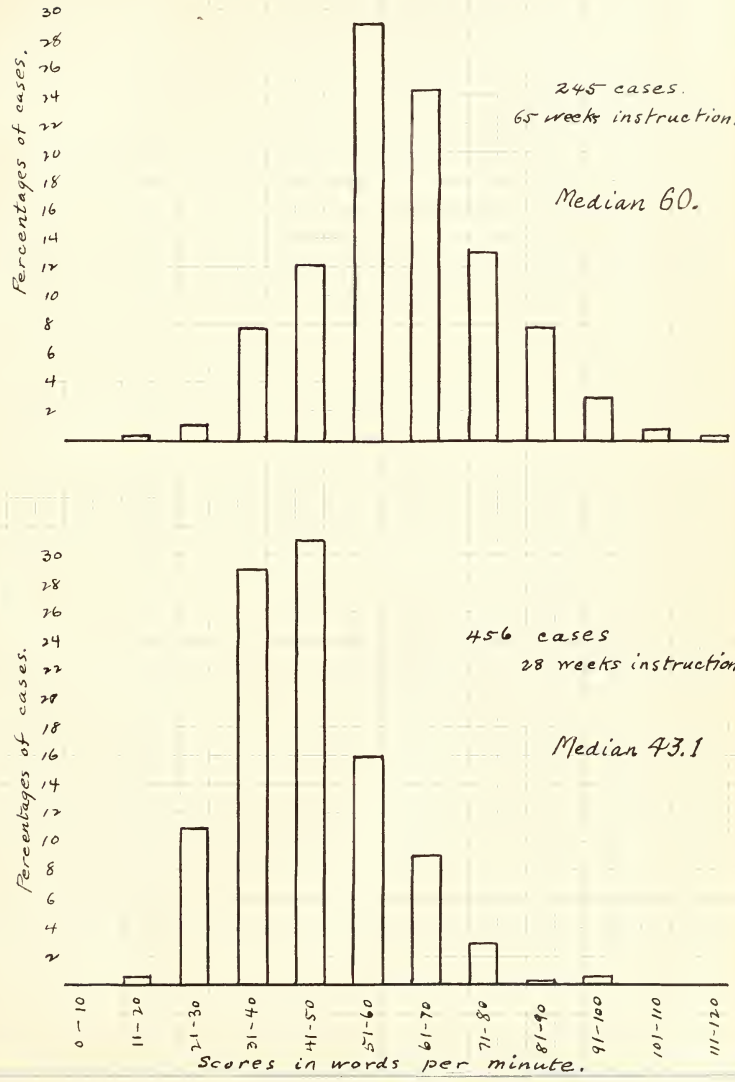

Figure XLV

Quality of pupils' shorthand notes. (701 cases.)

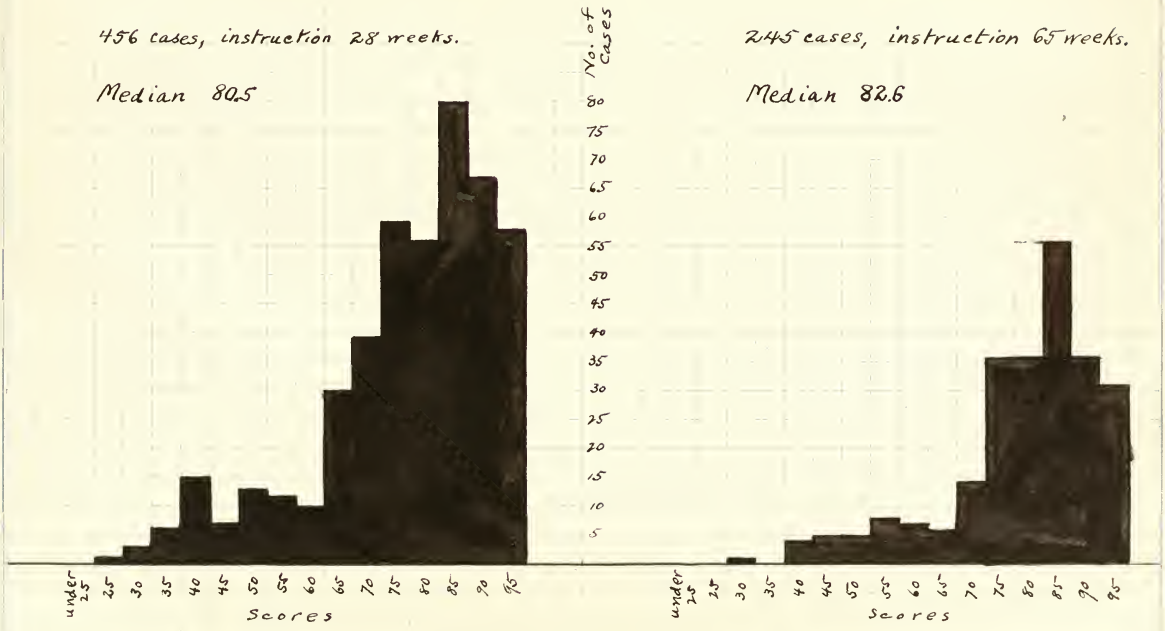

Table XII shows the relationship between speed and quality of notes for 700 cases. The coefficient of correlation has been found to be .22 with a P. E. of .02. This may be interpreted as indicating that the positive relationship is present, but not in any very marked degree. If in our high schools the improvement during the second year's work were as great for quality as for speed, the degree of relationship would probably be found to be considerably higher than that indicated by the coefficient .22.

TABLE XII

RELATIONSHIP BETWEEN SPEED AND QUALITY OF SHORTHAND NOTES SHOWN GRAPHICALLY

Scores for Quality	Scores for Speed										
	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120
95		5	15	18	11	15	14	4	1	1	
90		9	16	25	29	19	2	4	3		
85		13	15	38	29	16	6	6	3		
80		3	24	24	22	17	4	3	1		
75	1	4	19	21	17	18	4	1	2	1	
70	1	5	17	16	15	4	3	1			
65		4	7	9	8	1		1			
60	1	1	8	4	5	4		1			
55		1	5	6	3	2	4				
50		2	5	2	1		3				
45		2	7	4	1	2					1
40		3	7	4	1		2				
35		4	3	2							
30			1	2	1						
25			1								

No. of cases: 700
Coefficient of correlation .22
P. E. .02

A SCALE FOR MEASURING KNOWLEDGE OF THE SYSTEM

How shall the student's knowledge of the system of shorthand be measured? In the first effort to devise a measure for knowledge of the system, a collection was made of such questions as teachers of shorthand are accustomed to ask on their "examinations". The purpose was to select certain such questions or exercises calling for knowledge of the system, and to form preliminary tests from which the difficulties of values of the several exercises might be ascertained, after which such of them as seemed suitable could be made into one or more forms of a test for knowledge of the system of Gregg Shorthand. When the collection was made, however, the result was such a chaos that when an alternate plan suggested itself, this original plan was given up. The plan adopted appeared to hold out the promise of being, if not easier of accomplishment, certainly the more useful of the two.

This second plan was to take the 1000 commonest words as given in the Ayres Spelling Scale, make them up into preliminary vocabulary tests in shorthand, and from these, ascertain the difficulties or values of the 1000 words from the standpoint of shorthand writing, which would make it possible to arrange these words in a Shorthand Scale, similar in style to the spelling scales.

Further consideration, however, showed the necessity for a revision or enlargement of this plan, for it was recognized that knowledge of shorthand includes the ability to write phrases as well as words. For this reason it seemed necessary that such a scale should include the values of phrases as well as words. Accordingly, the first impulse was to include with the 1000 commonest words the approximately 570 phrases given in the Manual. Investigation showed, however, that at least some of these were rather unusual in their occurrence, and a knowledge of them, therefore, not very important. It was concluded that an investigation should be made in the effort to secure a list of the 500 most common phrases in actual use. Inasmuch as this investigation was of the same nature as that of Ayres leading to his list of 1000 commonest words, it may be well to describe, very briefly, both investigations.

During the years 1914 and 1915 the Division of Education of the Russell Sage Foundation conducted a study with the object of developing a scale for measuring the attainment of school children in spelling. For this purpose an effort was made to select the commonest words in the English language. This was accomplished by combining the results of four investigations, each of which aimed at identifying the commonest words.

These four studies were: First, Rev. J. Knowles, London, England, 1904, "The London Point System of Reading for the Blind", including a tabulation of 100,000 words from the Bible and various authors; second, R. C. Eldridge, Niagara Falls, 1911, "Six Thousand Common English Words", including a tabulation of 43,989 words; third, Russell Sage Foundation Monograph, 1913, "The Spelling Vocabularies of Personal and Business Letters", with a tabulation of 23,629 words; fourth, Cook and O'Shea, 1914, "The Child and His Spelling", including a tabulation of some 200,000 words.

By combining these four studies, including a total of about 368,000 words, written by more than 2,500 different persons, it was found possible to select a list of 1,000 words with the highest frequencies, which may therefore be regarded as the commonest words in the English language, so far as our information goes. The thousand words constitute about 92 per cent of ordinary composition. These words were arranged in the form of a scale and published in a monograph entitled, "Measurement of Ability in Spelling", which has proved to be a very important contribution to the teaching of spelling. It is believed that the teaching of shorthand may be no less aided by the use of these same words in the form of a shorthand scale, especially since these words will

constitute so large a part (92 per cent) of all that the stenographer will ever be called upon to write.

An investigation similar to those which were combined in the study just described was made for the purpose of deriving a list of the most common phrases in such literature as stenographers are accustomed to "take". The material used for this purpose was the following books: the "Legend of Sleepy Hollow" and "Rip Van Winkle" from Irving's "Sketch Book"; "Gregg Speed Studies"; "Alice's Adventures in Wonderland", by Lewis Carroll; "Graded Readings in Gregg Shorthand", by Alice M. Hunter; "The Art of Making a Speech"; "Gregg Shorthand Reader"; and two popular dictation books, containing modern business letters and literary matter, "Dictation Course in Business Literature, Book I", Reigner, the H. M. Rowe Co., and Eldridge's "Shorthand Dictation Exercises" by the American Book Company.

This body of material is estimated at approximately 500,000 words. Much of the material may be had from the publishers of Gregg Shorthand in the form of expert notes. It was a simple matter to tabulate the phrases as used by the writers of these notes. The authority of the publisher's experts is back of the selection of the phrases. Otherwise there might be some difference of opinion as to what words should be "phrased". In the case of the material for which no shorthand notes are published, the plan was to have an expert teacher of shorthand underscore with a pencil the groups of words which should be phrased in writing. Clerical workers then went over these sheets and counted the phrases as underscored. This investigation involved a prodigious amount of labor, which probably no one can appreciate who has not attempted something of the sort.

6418 different phrases were tabulated, with the number of appearances of each--a total of 41,421 phrases. Incidentally, the great importance of phrasing for success in shorthand work may be seen from the fact that there occurs on the average one phrase to every ten or twelve words.

It was then discovered that by selecting from the entire mass of material all phrases which had been found to occur fourteen or more times, a list of 500

phrases was secured, which may with some justification be regarded as the 500 commonest phrases in the English language, or at least in those forms of literature included in the investigation. Approximately three-fifths of this material consists of business letters. The remainder is of miscellaneous sorts, including literature, newspaper editorials, extracts from addresses, and so forth.

It should be noted that in counting the frequencies of the phrases included in the 500, the frequencies of other less common phrases, of which certain of these form a part, were added. For example, the phrase, "and have" was credited also for all occurrences of such phrases as, "and have the", "and have you", etc. This was done for the reason that it was felt that only by so doing would the several phrases be given the importance that they deserve.

Those who are acquainted with shorthand will not need an explanation of the fact that many combinations of words are included in the list which are not phrases in the ordinary sense of the word "phrase" as used in grammar. For the purpose of this investigation any group of words written "joined," or together, is regarded as a phrase.

The total frequencies of the 500 commonest phrases is 32,353, out of a total of 41,421 phrases tabulated, or 78 per cent. This means that pupils who master the 500 phrases will be able to write not less than 78 per cent of all phrases they meet, as a result of this practice alone. The fifty commonest phrases have a total frequency of 16,903, or about 41 per cent of all the phrases tabulated.

The 1000 commonest words and 500 commonest phrases were arranged in ten Vocabulary Tests, known as C-1, C-2, ...C-10, including 100 words and 50 phrases to each test. The words and phrases for the several tests were selected in a purely chance order, by taking for test C-1 every tenth word or phrase, for C-2 the words and phrases next following, and in like manner for the other eight tests. These tests simply give the words and phrases in columns, with spaces opposite for the student's outlines. On the first page of each test will be found all the directions required by the teacher.

Pupil's Score
Total 150
Wrong _____
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-1 *Vocabulary*

Published by
THE GREGG PUBLISHING COMPANY
New York Chicago Boston San Francisco London

Name.....Age..... (Years / Months)

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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1. me
2. can
3. bed
4. not
5. be
6. today
7. had
8. live
9. hat
10. belong
11. ball
12. love
13. some
14. for
15. ride
16. spring
17. care
18. soon
19. take
20. dear
21. seven
22. inside
23. boat
24. gold
25. pay
26. place
27. every
28. wind
29. glad
30. glass
31. only
32. Friday
33. reach
34. try
35. clean
36. these
37. candy
38. begin
39. stop
40. turn
41. date
42. world
43. once
44. nothing
45. order
46. beside
47. born
48. enter
49. speak
50. off

51. understand	
52. office	
53. money	
54. offer	
55. wonder	
56. write	
57. broke	
58. April	
59. January	
60. doctor	
61. fifth	
62. retire	
63. proper	
64. personal	
65. company	
66. board	
67. until	
68. getting	
69. beautiful	
70. fortune	
71. department	
72. clerk	
73. destroy	
74. desire	
75. employ	

76. crowd	
77. measure	
78. running	
79. information	
80. enclose	
81. statement	
82. neighbor	
83. drown	
84. illustrate	
85. common	
86. effect	
87. Christmas	
88. arrive	
89. marriage	
90. piece	
91. volume	
92. concern	
93. refer	
94. earliest	
95. expense	
96. material	
97. citizen	
98. session	
99. extreme	
100. preliminary	

101. of the	
102. yours very truly	
103. I have	
104. there is	
105. of our	
106. there are	
107. and company	
108. to give	
109. five thousand	
110. to get	
111. at least	
112. we shall be	
113. of them	
114. they were	
115. we would	
116. I think	
117. I know	
118. to send	
119. under the	
120. some of the	
121. that are	
122. to meet	
123. that you	
124. to place	
125. of that	

126. to find	
127. to my	
128. we had	
129. to his	
130. have you	
131. we have not	
132. no doubt	
133. have the	
134. which was	
135. he does	
136. with regard to	
137. on it	
138. of this kind	
139. in making	
140. along the	
141. two or three	
142. in which the	
143. you do not	
144. my dear sir	
145. we are not	
146. give us	
147. we shall take pleasure	
148. dear doctor	
149. might be	
150. to put	

Pupil's Score
Total 150
Wrong _____
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-2 *Vocabulary*

Published by

THE GREGG PUBLISHING COMPANY

New York Chicago Boston San Francisco London

Name.....Age.....
Years Months

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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101	1. do	26. report
102	2. see	27. under
10-	3. top	28. print
10-	4. us	29. with
10	5. but	30. party
10	6. look	31 where
10	7. over	32 hour
10	8. kill	33. better
10	9. child	34 move
11	10. door	35 spell
11	11 law	36 club
11	12. then	37 night
11	13 if	38. able
11	14 ran	39. walk
11	15. tree	40 lesson
11	16 river	41 road
11	17 end	42. country
11	18. came	43. own
11	19 Mr.	44. ground
12	20 west	45. third
12	21 forget	46. teach
12	22. blue	47. goes
12	23 rest	48. railroad
12	24. read	49. past
12	25 large	50. true

51. follow	
52. great	
53. ready	
54. suffer	
55. tire	
56. expect	
57. feel	
58. history	
59. mean	
60. hear	
61. eight	
62. refuse	
63. judge	
64. everything	
65. quite	
66. September	
67. madam	
68. don't	
69. flight	
70. empire	
71. obtain	
72. though	
73. newspaper	
74. nearly	
75. property	

76. factory	
77. famous	
78. allow	
79. whom	
80. await	
81. perhaps	
82. weigh	
83. adopt	
84. different	
85. diamond	
86. distribute	
87. interest	
88. supply	
89. further	
90. certain	
91. organize	
92. associate	
93. minute	
94. whether	
95. responsible	
96. suggest	
97. necessary	
98. secretary	
99. practical	
100. disappoint	

101. in the	
102. that the	
103. from the	
104. of his	
105. have been	
106. you are	
107. in which	
108. one of the	
109. you know	
110. to me	
111. you would	
112. if you are	
113. very much	
114. to go	
115. through the	
116. we enclose	
117. in order	
118. and in	
119. we do not	
120. that will	
121. who are	
122. you will be	
123. to him	
124. to receive	
125. thank you for	

126. to have you	
127. to them	
128. we should like	
129. to serve	
130. he could	
131. who had	
132. on account of	
133. he did	
134. why not	
135. he should	
136. would not	
137. should have	
138. sometime ago	
139. it would be	
140. as it is	
141. when they	
142. they will	
143. your account	
144. please let	
145. we beg	
146. in this country	
147. we should be glad	
148. every day	
149. more or less	
150. up the	

Pupil's Score
Total 150
Wrong
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-3 *Vocabulary*

Published by

THE GREGG PUBLISHING COMPANY

New York Chicago Boston San Francisco London

Name.....Age..... Years Months

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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1. and
2. run
3. he
4. am
5. this
6. did
7. must
8. late
9. ice
10. yes
11. ask
12. house
13. how
14. was
15. sick
16. plant
17. fall
18. Sunday
19. after
20. will
21. happen
22. past
23. east
24. [illegible]
25. [illegible]
26. never
27. most
28. air
29. mine
30. upon
31. week
32. wife
33. water
34. delay
35. poor
36. seen
37. pass
38. gone
39. grant
40. half
41. March
42. meet
43. before
44. lead
45. push
46. happen
47. hold
48. uncle
49. might
50. took

51. charge	
52. Miss	
53. omit	
54. built	
55. pair	
56. need	
57. sure	
58. cause	
59. vote	
60. size	
61. afraid	
62. district	
63. weather	
64. rate	
65. none	
66. station	
67. truly	
68. Thursday	
69. travel	
70. mayor	
71. family	
72. o'clock	
73. daughter	
74. sometimes	
75. select	

76. publish	
77. serve	
78. position	
79. arrest	
80. suppose	
81. their	
82. wear	
83. secure	
84. object	
85. together	
86. general	
87. often	
88. assist	
89. serious	
90. witness	
91. summon	
92. automobile	
93. ought	
94. distinguish	
95. beginning	
96. mere	
97. divide	
98. association	
99. proceed	
100. especially	

101. to the	
102. to you	
103. of this	
104. if you	
105. in this	
106. must be	
107. with your	
108. we will	
109. to see	
110. to say	
111. to this	
112. to know	
113. when the	
114. did not	
115. dear madam	
116. and have	
117. I should	
118. as to the	
119. we must	
120. we remain	
121. will not	
122. and is	
123. to that	
124. we have been	
125. would have	

126. was the	
127. we could	
128. are you	
129. to work	
130. I don't	
131. by you	
132. so much	
133. I believe	
134. with our	
135. in connection with	
136. any one	
137. to learn	
138. this morning	
139. let me	
140. by which	
141. yes sir	
142. to speak	
143. will have	
144. railroad company	
145. we have the	
146. is in	
147. we think	
148. for him	
149. my dear Mr.	
150. upon his	

Pupil's Score
Total 150
Wrong
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-4 *Vocabulary*

Published by

THE GREGG PUBLISHING COMPANY

New York Chicago Boston San Francisco London

Name.....Age.....
Years Months

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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1. go
2. the
3. you
4. good
5. all
6. like
7. make
8. let
9. play
10. how
11. just
12. year
13. her
14. that
15. got
16. can't
17. first
18. show
19. thing
20. told
21. noon
22. town
23. son
24. cannot
25. down
26. found
27. made
28. fill
29. became
30. two
31. first
32. state
33. round
34. pound
35. finish
36. felt
37. shut
38. suit
39. help
40. father
41. next
42. another
43. know
44. such
45. point
46. begun
47. drill
48. ticket
49. begin
50. again

51. says	
52. who	
53. anyway	
54. center	
55. check	
56. thus	
57. least	
58. study	
59. court	
60. December	
61. uncle	
62. restrain	
63. worth	
64. chief	
65. knew	
66. attend	
67. whole	
68. spend	
69. rapid	
70. wait	
71. favor	
72. support	
73. answer	
74. declare	
75. connection	

76. represent	
77. estate	
78. field	
79. themselves	
80. wonderful	
81. imprison	
82. entertain	
83. honor	
84. provision	
85. convention	
86. tomorrow	
87. stopped	
88. difference	
89. doubt	
90. investigate	
91. official	
92. various	
93. absence	
94. consideration	
95. application	
96. senate	
97. principal	
98. career	
99. cordially	
100. annual	

101. it is	
102. with the	
103. five per cent	
104. for you	
105. into the	
106. should be	
107. if the	
108. it will	
109. from you	
110. to take	
111. had been	
112. do not	
113. with us	
114. to keep	
115. for us	
116. and was	
117. at our	
118. we may	
119. we shall be glad	
120. we want	
121. about it	
122. at last	
123. we wish	
124. we regret	
125. and it is	

126. we are in	
127. who is	
128. by this	
129. we desire	
130. if it	
131. five hundred thousand dollars	
132. that it	
133. if not	
134. your favor	
135. in this way	
136. at the time	
137. to send you	
138. to become	
139. of what	
140. can you	
141. you could	
142. to those	
143. and not	
144. so far as	
145. we sent you	
146. is it	
147. we trust that	
148. from which	
149. shall have	
150. we receive	

Pupil's Score
Total 150
Wrong _____
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-5 *Vocabulary*

Published by
THE GREGG PUBLISHING COMPANY
New York Chicago Boston San Francisco London

Name..... .....Age.....
Years Months

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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1.	at	
2.	in	
3.	will	
4.	little	
5.	your	
6.	six	
7.	school	
8.	big	
9.	sea	
10.	soft	
11.	way	
12.	to	
13.	them	
14.	his	
15.	north	
16.	wing	
17.	went	
18.	Monday	
19.	what	
20.	best	
21.	think	
22.	stay	
23.	help	
24.	May	
25.	why	

26.	side
27.	said
28.	along
29.	brother
30.	they
31.	sent
32.	July
33.	cost
34.	behind
35.	hurt
36.	full
37.	easy
38.	track
39.	news
40.	anything
41.	indeed
42.	trip
43.	were
44.	many
45.	within
46.	collect
47.	army
48.	account
49.	contract
50.	inform

51. member	
52. died	
53. front	
54. prove	
55. woman	
56. sorry	
57. himself	
58. copy	
59. dozen	
60. rather	
61. royal	
62. contain	
63. perfect	
64. remain	
65. between	
66. address	
67. enjoy	
68. repair	
69. beg	
70. Mrs.	
71. does	
72. reply	
73. engage	
74. firm	
75. except	

76. term	
77. remember	
78. ledge	
79. special	
80. direction	
81. written	
82. salary	
83. promise	
84. according	
85. increase	
86. consider	
87. motion	
88. examination	
89. condition	
90. therefore	
91. victim	
92. decide	
93. conference	
94. colonies	
95. difficulty	
96. receive	
97. testimony	
98. height	
99. character	
100. committee	

101. and the	126. we are sending you
102. by the	127. at any time
103. it was	128. for that
104. we shall	129. you desire
105. would be	130. if they
106. in our	131. hear from you
107. about the	132. this matter
108. five cents	133. in all
109. your letter	134. you want
110. does not	135. I shall be
111. as well as	136. call your attention
112. to pay	137. to tell
113. at all	138. which are
114. which will	139. on that
115. over the	140. for some time
116. as soon as	141. you're
117. at this	142. trusting that
118. yours respectfully	143. at first
119. it will be	144. there will be
120. dear Mr.	145. we should be pleased
121. among the	146. kindly let us
122. in it	147. will you please
123. he would	148. I don't know
124. we take	149. should not be
125. and sons	150. with that

Pupil's Score
Total 150
Wrong _____
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-6 *Vocabulary*

Published by

THE GREGG PUBLISHING COMPANY

New York Chicago Boston San Francisco London

Name.....Age.....
Years Months

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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10	1. an	
10	2. so	
10	3. we	
10	4. and	
10	5. out	
10	6. boy	
11	7. about	
10	8. mother	
11	9. day	
1	10. island	
1	11. got	
1	12. I	
1	13. other	
1	14. led	
1	15. white	
1	16. water	
1	17. back	
1	18. yet	
1	19. thank	
1	20. town	
1	21. states	
1	22. ground	
1	23. sand	
1	24. one	
	25. hill	

26. kind	
27. work	
28. last	
29. rain	
30. would	
31. mile	
32. hand	
33. grave	
34. around	
35. maybe	
36. fail	
37. catch	
38. watch	
39. await	
40. table	
41. hour	
42. fun	
43. loud	
44. morning	
45. done	
46. file	
47. pretty	
48. driven	
49. deal	
50. both	

51. case
52. change
53. aunt
54. rule
55. heard
56. young
57. press
58. matter
59. act
60. there
61. comfort
62. objection
63. figure
64. second
65. direct
66. public
67. request
68. awful
69. trouble
70. degree
71. husband
72. regard
73. oblige
74. final
75. region
76. section
77. either
78. claim
79. women
80. forward
81. arrange
82. visitor
83. wreck
84. already
85. manner
86. against
87. theater
88. particular
89. government
90. too
91. estimate
92. entitle
93. Wednesday
94. assure
95. scene
96. respectfully
97. discussion
98. organization
99. separate
100. decision

101. dear sir	
102. five dollars	
103. very truly yours	
104. in your	
105. can be	
106. of course	
107. to our	
108. of it	
109. but the	
110. if you will	
111. upon the	
112. we hope	
113. I shall	
114. who have	
115. we shall be please	
116. in regard to	
117. if you can	
118. before the	
119. on this	
120. for which	
121. could be	
122. it is not	
123. is that	
124. what is	
125. give you	

126. we trust	
127. I'll	
128. he can	
129. and their	
130. in fact	
131. if there	
132. to secure	
133. I should like	
134. and make	
135. it has been	
136. I could	
137. to which	
138. with this	
139. ought to	
140. if we	
141. yours sincerely	
142. we shall have	
143. B. & O.	
144. they would	
145. we wrote you	
146. less than	
147. within the	
148. in this matter	
149. that the	
150. years ago	

Pupil's Score
Total 150
Wrong _____
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-7 *Vocabulary*

Published by
THE GREGG PUBLISHING COMPANY
New York Chicago Boston San Francisco London

Name.....Age..... Years Months

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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1. a
2. no
3. an
4. old
5. time
6. book
7. say
8. thre
9. eat
10. yard
11. home
12. ad
13. baby
14. leg
15. spell
16. grow
17. away
18. find
19. its
20. far
21. east
22. outside
23. race
24. left
25. want

26. life
27. our
28. name
29. keep
30. any
31. seem
32. story
33. become
34. burn
35. across
36. set
37. black
38. flash
39. war
40. high
41. himself
42. people
43. leave
44. however
45. body
46. provide
47. style
48. real
49. almost
50. heart

51. while	
52. wire	
53. capture	
54. carry	
55. inspect	
56. fair	
57. God	
58. use	
59. been	
60. tax	
61. elect	
62. pleasure	
63. sudden	
64. slide	
65. appear	
66. friend	
67. raise	
68. usual	
69. entrance	
70. prison	
71. amount	
72. escape	
73. sail	
74. terrible	
75. convict	

76. relative	
77. effort	
78. primary	
79. present	
80. although	
81. forenoon	
82. publication	
83. prepare	
84. attention	
85. feature	
86. complete	
87. improvement	
88. affair	
89. opinion	
90. pleasant	
91. accident	
92. political	
93. really	
94. relief	
95. finally	
96. agreement	
97. arrangement	
98. emergency	
99. February	
100. principle	

101. on the

102. at the

103. to make

104. he was

105. may be

106. to have

107. of their

108. which is

109. this is

110. your order

111. do you

112. are not

113. could not

114. will you

115. let us

116. I would

117. we believe

118. in that

119. to ask

120. I was

121. I've

122. it is not

123. it has

124. which you

125. I want

126. as much

127. in your letter

128. I do not

129. at the same time

130. in my

131. if this

132. to sell

133. send us

134. at any

135. last year

136. if it is

137. you cannot

138. you see

139. ten days

140. in the future

141. at present

142. who can

143. did you

144. this is the

145. with its

146. on the other hand

147. your attention

148. in time

149. the order

150. you will have

Pupil's Score
Total 150
Wrong _____
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-8 *Vocabulary*

Published by

THE GREGG PUBLISHING COMPANY

New York Chicago Boston San Francisco London

Name.....Age..... (Years / Months)

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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1. it
2. now
3. my
4. bed
5. may
6. by
7. come
8. land
9. at
10. bring
11. touch
12. must
13. was
14. saw
15. back
16. blue
17. paper
18. give
19. cart
20. grow
21. card
22. dark
23. town
24. ship
25. girl
26. here
27. more
28. room
29. start
30. could
31. given
32. open
33. class
34. camp
35. tonight
36. money
37. warm
38. fall
39. summer
40. talk
41. answer
42. river
43. earth
44. mind
45. visit
46. sight
47. summer
48. mother
49. brought
50. month

51. also
52. few
53. wrote
54. chain
55. itself
56. dollar
57. teacher
58. thought
59. yesterday
60. number
61. aboard
62. navy
63. forty
64. farther
65. liberty
66. during
67. August
68. complaint
69. importance
70. engine
71. human
72. since
73. cities
74. surprise
75. private

76. progress
77. important
78. result
79. action
80. prompt
81. lose
82. machine
83. vessel
84. education
85. article
86. search
87. century
88. course
89. believe
90. guess
91. invitation
92. national
93. celebration
94. occupy
95. develop
96. unfortunate
97. reference
98. appreciate
99. immediate
100. judgment

101. for the	
102. we have	
103. has been	
104. you can	
105. to do	
106. to us	
107. is not	
103. of these	
109. you may	
110. that this	
111. in his	
112. we cannot	
113. I can	
114. five hundred dollars	
115. to write	
116. that it is	
117. which the	
118. and are	
119. and brother	
120. after the	
121. I wish	
122. I will	
123. may have	
124. and our	
125. of my	

126. as they	
127. sincerely yours	
126. in addition	
129. at this time	
130. it would	
131. if you wish	
132. was not	
133. that it was	
134. at that	
135. to any	
136. in these	
137. by return mail	
138. at the present time	
139. that there	
140. in the past	
141. business men	
142. will you kindly	
143. f. o. b.	
144. to bring	
145. with reference to	
146. rather than	
147. your name	
148. is to be	
149. there's	
150. you will receive	

Pupil's Score
Total 150
Wrong
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-9 *Vocabulary*

Published by

THE GREGG PUBLISHING COMPANY

New York Chicago Boston San Francisco London

Name.....Age.....
Years Months

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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1.	is	
2.	man	
3	up	
4	red	
5	into	
6	have	
7	hand	
8.	cold	
9	lot	
10	tell	
11	mail	
12.	one	
13	about	
14	face	
15.	blew	
16.	lake	
17	past	
18.	new	
19	or	
20.	alike	
21	south	
22	band	
23	five	
24	train	
25.	part	

26.	car	
27	when	
28	hope	
29	mail	
30	should	
31	without	
32	skirt	
33	horse	
34	bear	
35.	tenth	
36	light	
37	unless	
38	tight	
39	above	
40	June	
41	wash	
42	held	
43	chair	
44	shall	
45	extra	
46	stood	
47	bought	
48	mountain	
49	love	
50	children	

51. return	
52. please	
53. else	
54. death	
55. always	
56. evening	
57. November	
58. person	
59. among	
60. October	
61. jail	
62. fourth	
63. instead	
64. duty	
65. enough	
66. through	
67. Tuesday	
68. auto	
69. carried	
70. visit	
71. view	
72. which	
73. known	
74. period	
75. command	

76. entire	
77. due	
78. Saturday	
79. justice	
80. attempt	
81. combination	
82. toward	
83. busy	
84. director	
85. service	
86. treasure	
87. total	
88. neither	
89. system	
90. circular	
91. accept	
92. recent	
93. folks	
94. probably	
95. circumstance	
96. majority	
97. evidence	
98. sincerely	
99. convenient	
100. recommend	

101. to be	
102. will be	
103. I am	
104. we can	
105. and that	
106. of all	
107. at once	
108. on your	
109. of which	
110. of its	
111. that they	
112. as to	
113. in reply	
114. he had	
115. you will find	
116. and will	
117. any other	
118. for it	
119. can not	
120. in such	
121. of time	
122. not only	
123. the other	
124. few days	
125. on his	

126. in any	
127. the time	
128. in order that	
129. do so	
130. of those	
131. in the world	
132. and see	
133. to call	
134. cannot be	
135. to their	
136. just as	
137. he cannot	
138. I can't	
139. this will	
140. on hand	
141. for their	
142. with which	
143. five pounds	
144. to come	
145. young man	
146. the whole	
147. and also	
148. I suppose	
149. they're	
150. you wish	

Pupil's Score
Total 150
Wrong
Right

A SERIES OF TESTS IN GREGG SHORTHAND

Arranged By Elmer Hoke, A. M.

TEST C-10 *Vocabulary*

Published by

THE GREGG PUBLISHING COMPANY

New York Chicago Boston San Francisco London

Name.....Age.....
Years Months

Race.....Sex.....Grade.....

City.....State.....Date.....

School.....Teacher.....

How long have you studied Gregg Shorthand?.....Months

Directions for Giving Test

1. Distribute papers face up on the desks. Ask pupils not to open papers until the signal is given.

2. Have pupils fill in blanks on the cover page.

3. Then say: "On the inside of this folder are 100 common words and 50 common phrases, with a space opposite each. You are to write in these spaces the shorthand outlines for the accompanying words and phrases. Accuracy is as important as speed. Work as fast as you can do it correctly. When I say, 'Ready, Start,' you may begin work. You will be given enough time to finish the work."

4. Give the signal to begin work and collect the papers as they are finished.

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1. she	
2. ten	
3. last	
4. of	
5. him	
6. are	
7. ring	
8. hot	
9. box	
10. five	
11. long	
12. has	
13. men	
14. miss	
15. block	
16. page	
17. each	
18. letter	
19. thank	
20. add	
21. deep	
22. game	
23. age	
24. saw	
25. still	

26. word	
27. from	
28. same	
29. eye	
30. city	
31. afternoon	
32. lady	
33. care	
34. clear	
35. sir	
36. coming	
37. clothing	
38. buy	
39. express	
40. right	
41. because	
42. church	
43. flower	
44. alone	
45. dress	
46. fix	
47. paid	
48. steamer	
49. event	
50. build	

51. those	
52. picture	
53. bridge	
54. learn	
55. something	
56. plan	
57. subject	
58. nor	
59. question	
60. reason	
61. shed	
62. population	
63. throw	
64. intend	
65. fact	
66. police	
67. struck	
68. vacation	
69. loss	
70. guest	
71. election	
72. length	
73. several	
74. addition	
75. debate	

76. president	
77. include	
78. appoint	
79. gentleman	
80. whose	
81. avenue	
82. success	
83. prefer	
84. purpose	
85. injure	
86. popular	
87. mention	
88. local	
89. possible	
90. argument	
91. impossible	
92. business	
93. meant	
94. foreign	
95. issue	
96. elaborate	
97. experience	
98. athletic	
99. receipt	
100. allege	

101. we are	
102. of you	
103. you will	
104. is the	
105. as the	
106. you have	
107. that is	
108. there are	
109. more than	
110. he is	
111. he will	
112. United States	
113. five thousand dollars	
114. on our	
115. we should	
116. as you	
117. I had	
118. respectfully yours	
119. in its	
120. five hundred	
121. than the	
122. thank you	
123. that's	
124. to it	
125. from this	

126. shall be	
127. New York City	
128. to look	
129. send you	
130. has not	
131. we find	
132. it may be	
133. and they	
134. we feel	
135. from our	
136. who was	
137. of such	
138. in this case	
139. I do	
140. under separate cover	
141. to believe	
142. if you do not	
143. you did	
144. for these	
145. very glad	
146. better than	
147. to furnish	
148. as follows	
149. it must be	
150. to all	

It is believed that the material included in these ten tests will ultimately have great value as a body of drill material for the teacher's use. Inasmuch as these words make up approximately 92 per cent of ordinary composition, and the phrases 78 per cent of all phrases commonly met with, it will be found a very effective method of teaching, to drill this small body of material until thoroughly mastered by the pupil, so that it may be written rapidly and correctly. This will improve speed of writing, and will go a long way in securing legibility.

In order to secure data for the calculation of the values or difficulties of the words and phrases, teachers of shorthand were invited to cooperate in the construction of the scale by using the tests with their classes and returning them for scoring and tabulation.

In order that the tests might be scored in accordance with a uniform procedure, the scoring was not left to the teachers, but instead the teachers were requested to send in the tests themselves, after having scored them for their own purposes. The tests were given just before the close of school in June, 1921. 2818 tests were received, an average of 281.8 for each of the ten forms of the C tests. These were scored in accordance with the following directions:

STANDARD DIRECTIONS FOR SCORING THE C TESTS.

1. All words and phrases are to be scored strictly in accordance with the Gregg system, as per key.

2. Where the key gives two forms, either should be counted correct.

3. The dot for "h" on words like "had" may or may not be used. Count it correct with or without the dot.

4. Capital letters not indicated by " , counted wrong.

5. Whenever the intention of the writer was correct, give full credit, even though the word is poorly written. This is not a test for quality of writing.

6. If the word or phrase is so poorly written that you cannot be sure the writer had the correct thing in mind, count it wrong.

7. Pay no attention to other marks made by teachers. Only the marks made in our own scoring will be counted. Use a blue pencil.

8. The first consonant should be reasonably near the line of writing. One-sixteenth of an inch is reasonably near. If further from the line of writing, count it wrong. (This rule does not apply to such consonants as s, x, w, h, and sh.)

(The key was prepared by a committee of experts appointed by the Gregg publishers, and is regarded as authoritative.)

In accordance with these standard directions, three different clerical helpers shared in the work of scoring tests C-1, C-2, C-3, C-4 and C-5, while the remaining five forms were all scored by a single person. The median number of correct responses on the first five tests was 116.4, while on the last five it was 117.2. This indicates a variation of eight-tenths of a point in the scoring of the tests by different persons, showing that the scoring of vocabulary tests is more objective than might have been supposed. This argument is based on the assumption that the ten forms of the C test are of equal difficulty. Inasmuch as each form represents a purely random selection of 150 elements from a list of 1500, the assumption seems a perfectly rational one.

A study of the following table appears to the writer to justify these conclusions:

1. That the ten forms of the C tests are approximately equal in difficulty.
2. That the work of different scorers is satisfactorily objective.
3. That the number of cases is large enough to insure the reliability of the norms within three or five per cent. The extreme variation between the medians is found between C-1 and C-4, 8.5 points, or 5.7 per cent of the total 150 points.

TABLE XIII

NUMBER OF CASES AND MEDIAN SCORES ON THE C TESTS
(2818 cases)

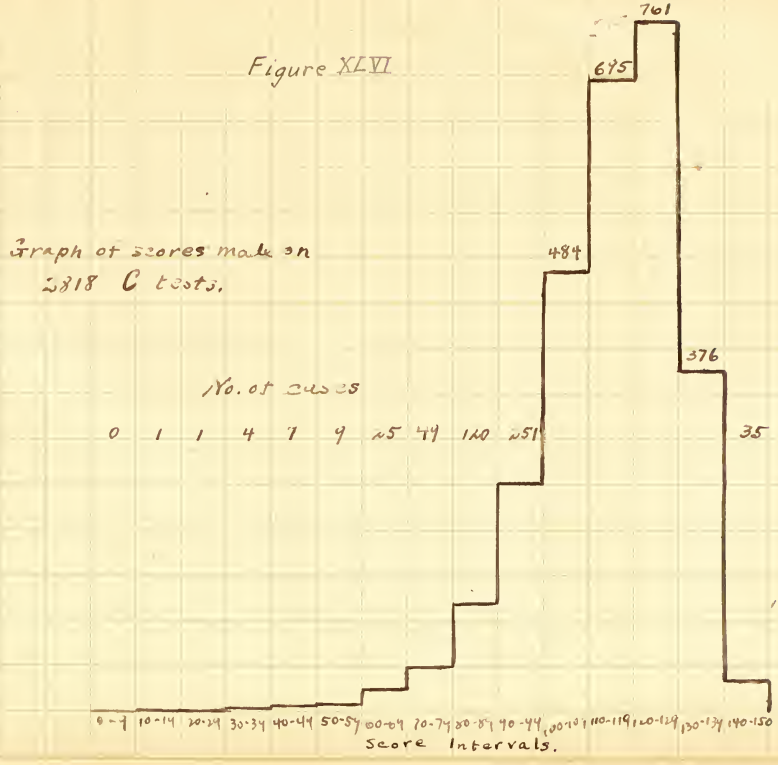
	No. of cases in different groups, by yrs.				Median scores for groups who had studied shorthand the time indicated in years:			
	1	1½	2	All	1	1½	2	All groups
C-1	158	162	45	365	107.2	115.9	115.5	111.7
C-2	144	103	45	292	110.6	122.3	115.	115.3
C-3	127	85	47	259	107.9	121.5	118.3	115.1
C-4	115	95	44	254	115.	123.9	123.1	120.2
C-5	138	81	54	273	114.	125.3	122.6	119.5
C-6	114	79	62	255	113.7	121.2	112.1	115.7
C-7	108	91	67	266	113.6	124.5	121.8	120.
C-8	108	93	89	290	111.2	123.4	119.4	119.
C-9	167	79	52	298	112.6	122.	117.5	116.
C-10	133	80	53	266	112.4	121.9	114.	115.4
Avg. 1-5	136	105	47	288	110.9	122.	118.7	116.4
Avg. 6-10	126	80	65	275	112.7	122.6	117.	117.2

The distribution of ability in knowledge of the system as measured by the C tests is indicated on the following graph. It will be noticed that there is a scattering .9 of one per cent of the 2818 cases who make scores ranging from 0 to 60 per cent correct responses on the C tests. From 60 to 100 (per cent) or from 90 to 150 (points) the distribution shows a fairly close approximation to the normal frequency one.

The most noticeable feature of the results found for the three groups who had had shorthand instruction one year, one and one-half years, and two years respectfully, is the fact that their medians show very slight differences. The improvement from the first year to the one and one-half year group is approximately 8 per cent, while from the one to the two year group it is only 4 per cent. The fact that the second year group seems to be slightly inferior to those who had a half year less instruction, is probably to be explained as due to the selection of the schools tested. But taken with the other facts just noted, it does justify the conclusion that the second year of shorthand instruction makes very little improvement in the pupils ability to use the system.

These facts together with the further fact that the distributions for the different groups are very similar are shown by the following table of quartile points. The figures indicate percentages of correct responses.

Figure XLVI



Graph of scores made on 2318 C tests.

TABLE XIV

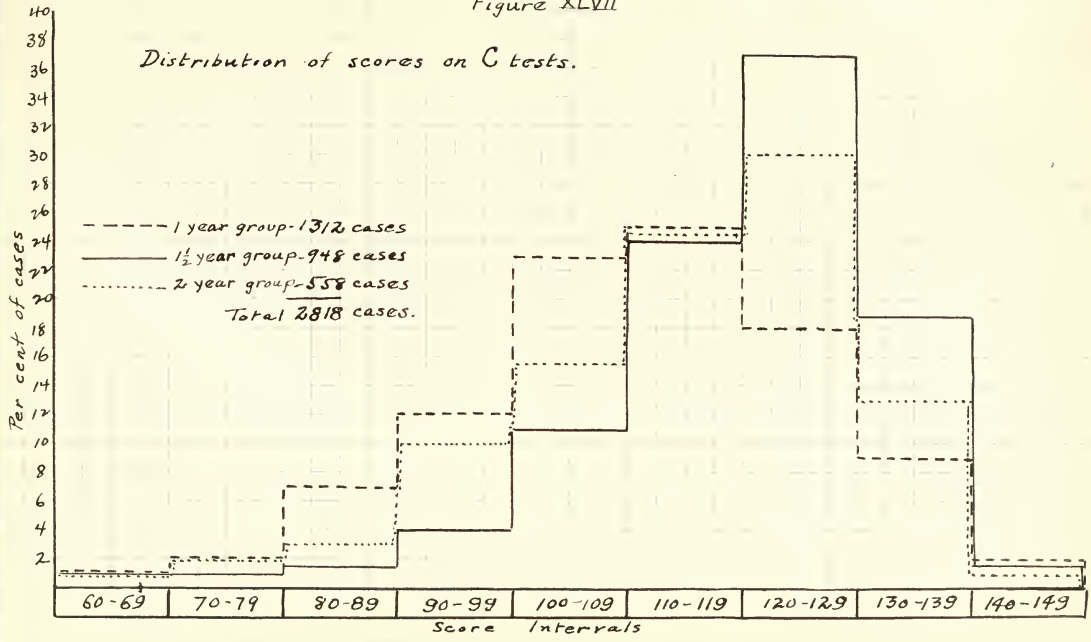
QUARTILE POINTS IN PER CENT OF CORRECT RESPONSES FOR GROUPS WHO HAVE HAD INSTRUCTION THE NO. OF YEARS INDICATED

	1 YR.	1½ YRS.	2 YRS.	ALL
Q_1	67	75	71	70
Q_2	74	81	78	78
Q_3	81	86	84	84

The similarity of the three curves is shown on the following graph. The writer regards the above figures, together with the other facts that have been presented, as satisfactorily justifying the procedure which was followed in preparing the scale for knowledge of the system. This procedure we must now describe.

After all the test sheets had been carefully scored in accordance with the standard procedure already described, the number of incorrect responses to each of the 1500 words and phrases was counted, the percentage of incorrect responses to each word was calculated, and from this figure the percentage of correct responses to each word or phrase was derived. Each word and phrase was then placed in the column of the scale to which its record showed it to belong. This means, therefore, that words or phrases found in the column marked "84" for example, have been found to be of such difficulty that

Figure XLVII



if a test be made up of these words and given to a class of pupils who have had from one to two years of instruction in shorthand, the class should make a median score of approximately 84 per cent, if it is up to "standard".

In arranging this scale the plan used by Ayres in constructing his Spelling Scale has been adopted. For an explanation of the theory underlying this type of scale the reader is referred to his monograph, "The Measurement of Ability in Spelling". The final paragraph of his discussion, however, applies with equal force to this scale, and is therefore quoted with the change of just a few words. "In all such testing it must be remembered that the present scale....will become increasingly and rapidly less reliable for measuring purposes as the children become more accustomed to writing these particular words and phrases. In proportion as these lists are used for the purposes of classroom drill, the scale will become untrustworthy as a measuring instrument. Probably the scale will have served its greatest usefulness in any locality when the school children have mastered these 1,000 words and 500 phrases so thoroughly that the scale has become quite useless as a measuring instrument." (Changes or additions are denoted by underscoring.)

FOLD OUT

Inasmuch as the differences in ability between the three separate groups tested are so small as to be negligible, no differentiation is made on the scale between the norms for those who have had shorthand instruction one year, one and one-half years, or two years. The words were placed in their respective columns on the basis of their record in all three groups combined. For those who have had shorthand but one year the norms may be regarded as approximately one-half step too high. For those who have had instruction one and one-half or two years, the norms are probably a half step too low. It would be statistically possible, of course, to work out this scale in such a way as to make the slight differentiations which the results seem to show. To do so, however, would be to set up a foolishly elaborate statistical procedure, based on a fundamental procedure in collecting data which was not of so extended or perfect a nature as to justify the elaboration. It would, furthermore, be making distinctions of such unimportant proportions that they would be invalidated or outweighed by minor variations or errors in the procedure of giving and scoring tests. It is felt that such elaboration would lay one open to a very just charge of straining at a gnat and swallowing a camel, particularly in view of the fact that the average number of cases on which each word was scaled was only 282.

SUMMARY

We have seen that the measurement of shorthand ability involves the measurement of reading ability, speed of writing, quality of writing, and knowledge of the system. Accordingly we have constructed tests and scales as follows:

1. Test A-1, Reading Ability.
2. Tests B-1 and B-2, Speed of Writing.
3. A Measuring Scale for Gregg Shorthand Penmanship.
4. A Scale for Measuring Knowledge of Gregg Shorthand.
   (The data for this scale were derived from the use of ten Vocabulary Tests, C-1 to C-10.)

From the use of these tests and scales data have been collected which seem to justify the following suggestions as to the teaching of shorthand:

1. The scores for reading ability are too low for efficiency in stenographic work. More practice needs to be given in reading shorthand.

2. The second-year group shows an improvement of only two or three per cent over the first-year group in quality of shorthand penmanship. This condition calls for some remedy.

3. The question of "artistry" versus mere legibility in shorthand penmanship needs to be settled. After pupils have attained to a legible shorthand, there is little justification for spending time in the effort to get beauty.

4. The one school whose results in shorthand penmanship were most outstanding, used the device of having students who have trouble with the formation of their outlines, trace them by using tracing paper, until they get the "swing of it".

5. In knowledge of the system the second-year group does no better than the first. The explanation is probably to be found in the lack of a definite goal and in scattered and wasted practice.

6. Emphasis should be placed upon drill or practice with a view to the mastery of the 1000 commonest words and the 500 commonest phrases. These make up 92 per cent of the words in English composition, and 78 per cent of the phrases.

7. Many pupils fail to write words correctly, even though they have memorized the rules involved. Emphasis should be placed on writing correctly, rather than upon the rules of the system.

8. Tablets containing the 1500 words and phrases appropriately arranged in drill sheets, would be an effective teaching device.

9. The data derived from nearly 3000 vocabulary tests, nearly 450,000 attempts to write words and phrases, show the degree of accuracy to be approximately 78 per cent. More intensive practice on a smaller number of the most common words and phrases should greatly improve this record.

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Rip Van Winkle. " "

Legend of Sleepy Hollow. " "

Gregg Speed Studies.

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VITA

Elmer Rhodes Hoke, born at Ada, Ohio, September 16, 1892, attended public elementary schools of York and Lancaster, Pennsylvania, and the High School at Lewistown, Pennsylvania, graduating in 1909. After four years he received the A. B. degree from Franklin and Marshall College, Lancaster, Pennsylvania, and the following year the A. M. degree from the same institution. A further course of study of three years in the Theological Seminary of the Reformed Church in the United States, at Lancaster, Pennsylvania, led to the B. D. degree in 1917. After two years of study in Johns Hopkins University he received the A. M. degree in June, 1920.

The writer acknowledges with a deep sense of gratitude the privileges enjoyed and the benefits derived from study with the following teachers in the University: Professors Buchner, Dunlap, and Lovejoy, Doctors Weglein, Brooks, Johnson, Kamberger and Slonimsky. He is particularly indebted to Dr. Weglein for suggesting this field of study, and to Professor Buchner and Dr. Brooks for continual encouragement, advice and assistance during the progress of the work.